

Natural Gamma Ray Rate Of Penetration



1 : 240

County : Harper		Field : Wildcat																																	
Location : Lat: 37° 4' 50.30" North Long: 98° 4' 23.70" West		Well : Albright Croft Farms 3407 15-1H																																	
Company : Shell Exploration & Production		Rig : Nabors 774																																	
Permanent Datum : Ground Level Elevation : 1393.72 ft Log Measured From : Drill Floor 21.68 ft Above Permanent Datum Drilling Measured From : Drill Floor		Other Services Directional Services																																	
Depth Logged : 80.00 ft To 9,063.00 ft Date Logged : 17-Feb-12 To 05-Apr-12 Total Depth MD : 9,063.00 ft TVD : 4,749.41 ft Spud Date : 17-Feb-12		Unit No. : PP 47 Job No. : OK-XX-0009199272 Plot Type : Final Plot Date : 18-Apr-12																																	
LOCATION Latitude : 37° 4' 50.30" North Longitude : 98° 4' 23.70" West UTM Easting = 2,124,500.95 ft UTM Northing = 151,020.08 ft		Company : Shell Exploration & Production Rig : Nabors 774 Well : Albright Croft Farms 3407 15-1H Field : Wildcat County : Harper API Number : 15-077-21787																																	
Borehole Record (MD) <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>Run No.</th> <th>Size</th> <th>From</th> <th>To</th> </tr> <tr> <td>100</td> <td>12.250 in</td> <td>80.00 ft</td> <td>825.00 ft</td> </tr> <tr> <td>200</td> <td>8.750 in</td> <td>825.00 ft</td> <td>3,982.00 ft</td> </tr> <tr> <td>300</td> <td>8.750 in</td> <td>3,982.00 ft</td> <td>5,430.00 ft</td> </tr> <tr> <td>600</td> <td>6.125 in</td> <td>5,430.00 ft</td> <td>9,063.00 ft</td> </tr> </table>		Run No.	Size	From	To	100	12.250 in	80.00 ft	825.00 ft	200	8.750 in	825.00 ft	3,982.00 ft	300	8.750 in	3,982.00 ft	5,430.00 ft	600	6.125 in	5,430.00 ft	9,063.00 ft	MD LOG Elev. KB N/A DF 1415.40 ft GL 1393.72 ft WD N/A													
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WELL INFORMATION

MWD Run Number	100	200	300	600
Date run completed	19-Feb-12	19-Mar-12	23-Mar-12	06-Apr-12
Rig Bit Number	100	200	300	600
Bit Size (in)	12.250	8.750	8.750	6.125
Tool Nominal OD (in)	8.000	6.750	8.000	4.750
Log Start Depth (MD, ft)	80.00	825.00	3,982.00	5,430.00
Log End Depth (MD, ft)	825.00	3,982.00	5,430.00	9,063.00
Drill or Wipe	Drill	Drill	Drill	Drill
Drill/Wipe Start Date and Time	18-Feb-12 08:43	15-Mar-12 04:42	19-Mar-12 19:00	30-Mar-12 14:57
Drill/Wipe End Date and Time	19-Feb-12 16:54	18-Mar-12 20:00	23-Mar-12 04:50	05-Apr-12 13:25
Min Inc (deg) @ Depth (MD, ft)	.42 @ 208.00	.04 @ 3,345.00	.22 @ 3,917.00	88.12 @ 5,774.00
Max Inc (deg) @ Depth (MD, ft)	5.54 @ 610.00	3.79 @ 887.00	90.06 @ 5,370.00	93.08 @ 9,063.00
Bit TFA(in2) / Bit Type	.58 / Tricone	.66 / PDC	.66 / PDC	.68 / PDC
Flow Rate (gpm)	670.00	520.00	500.00	300.00
Max AV (fpm) / CV (fpm) @ MWD	214.0 / 506.0	432.1 / 532.2	405.0 / 495.0	552.0 / 257.0
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel
Density (ppg) / Viscosity (spqt)	8.80 / 55.00	9.10 / 46.00	9.30 / 46.00	8.60 / 33.00
Filtrate CL (ppm)	3,200.00	13,000.00	16,000.00	1,000.00
pH / Fluid Loss (mptm)	10.00 / 1	9.50 / 1	10.50 / 1	7.80 / 2
PV (cP) / YP (lbf/ft)	10 / 12.00	21 / 18.00	12 / 15.00	3 / 5.00
% Solids / % Sand	3.80 / 0.25	5.00 / 0.25	6.50 / 0.10	1.80 / 0.25
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A

Max Tool Temp (degF) / Source	100.62 / PCM	128.73 / PCM	144.54 / PCM	146.84 / PCM	
Rm @ Max Tool Temp (degF)	N/A @ 100.62	N/A @ 128.73	N/A @ 144.54	N/A @ 146.84	
Lead MWD Engineer	John Blair	John Blair	Jared Howton	John Blair	
Customer Representative	Tyrome Russell	Tyrone Russell	Tyrone Russell	Tyrone Russell	

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM	PCM	
Software Version	5.76	5.76	5.76	5.76	
Sub Serial Number	11812725	11619281	11619281	11595279	
Insert Serial Number	11680736	11620306	11680736	11620306	
Date and Time Initialized	17-Feb-12 02:49	10-Mar-12 19:44	17-Mar-12 06:04	25-Mar-12 06:20	
Date and Time Read	19-Feb-12 23:44	19-Mar-12 06:27	23-Mar-12 18:56	06-Apr-12 04:39	
ECMB SW Version	N/A	N/A	N/A	N/A	

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	
Distance From Bit (ft)	64.37	65.30	57.66	46.52	
Software Version	6.21	6.21	6.21	6.21	
Sub Serial Number	11812725	11619281	11619281	11595279	
Sonde Serial Number	11477997	11833024	11477997	11833024	
Sensor ID Number	N/A	N/A	N/A	N/A	
Toolface Offset (deg)	120.44	20.73	197.57	263.85	

Gamma Ray Sensor Information

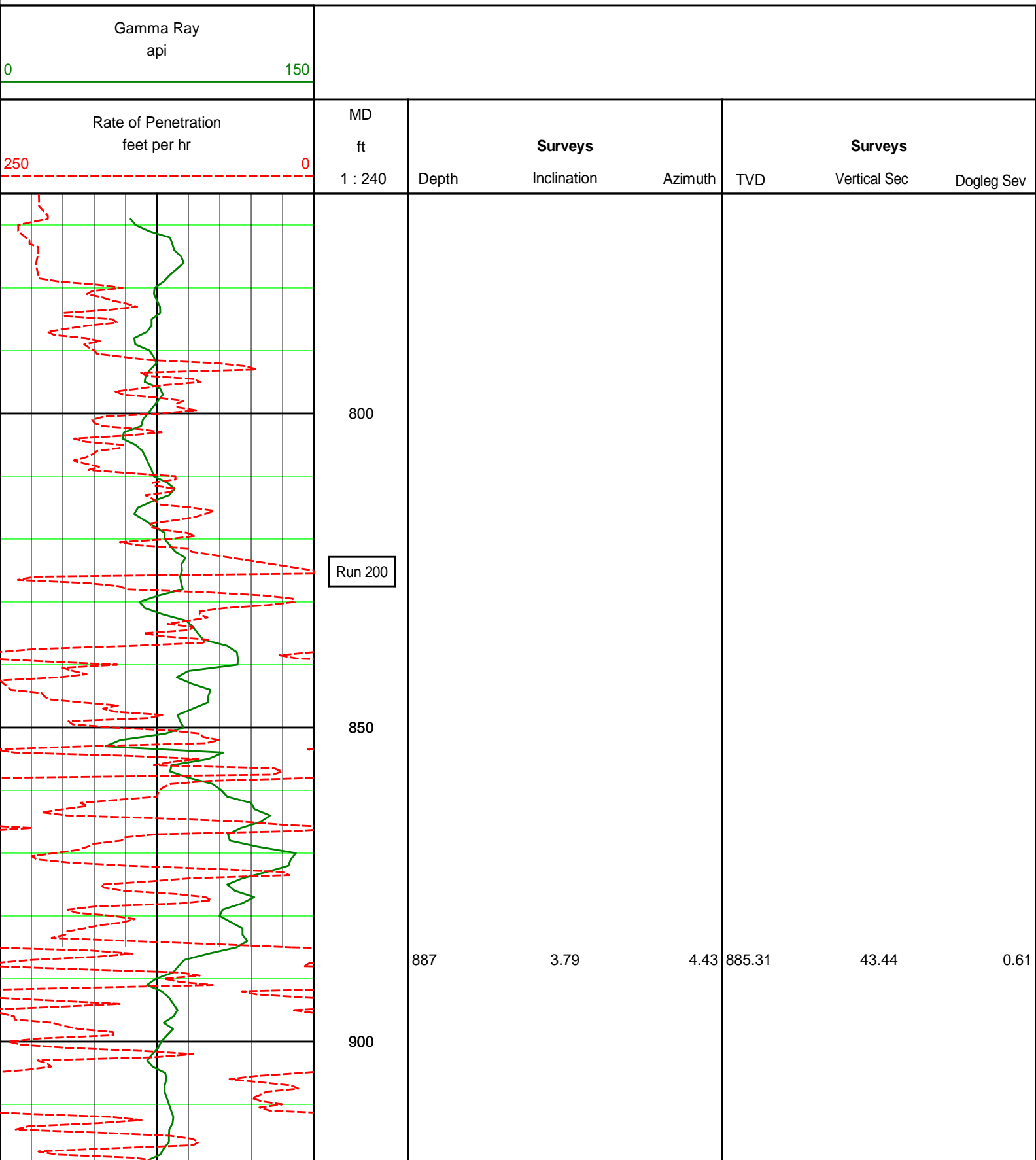
Tool Type	N/A	PCG	PCG	PCG	
Distance From Bit (ft)	N/A	60.60	52.49	51.11	
Recorded Sample Period (sec)	N/A	10	10	10	
Software Version	N/A	8.15	8.15	8.15	
Sub Serial Number	N/A	11619281	11619281	11595279	
Insert/Sonde Serial Number	N/A	11293413	11120602	11293413	

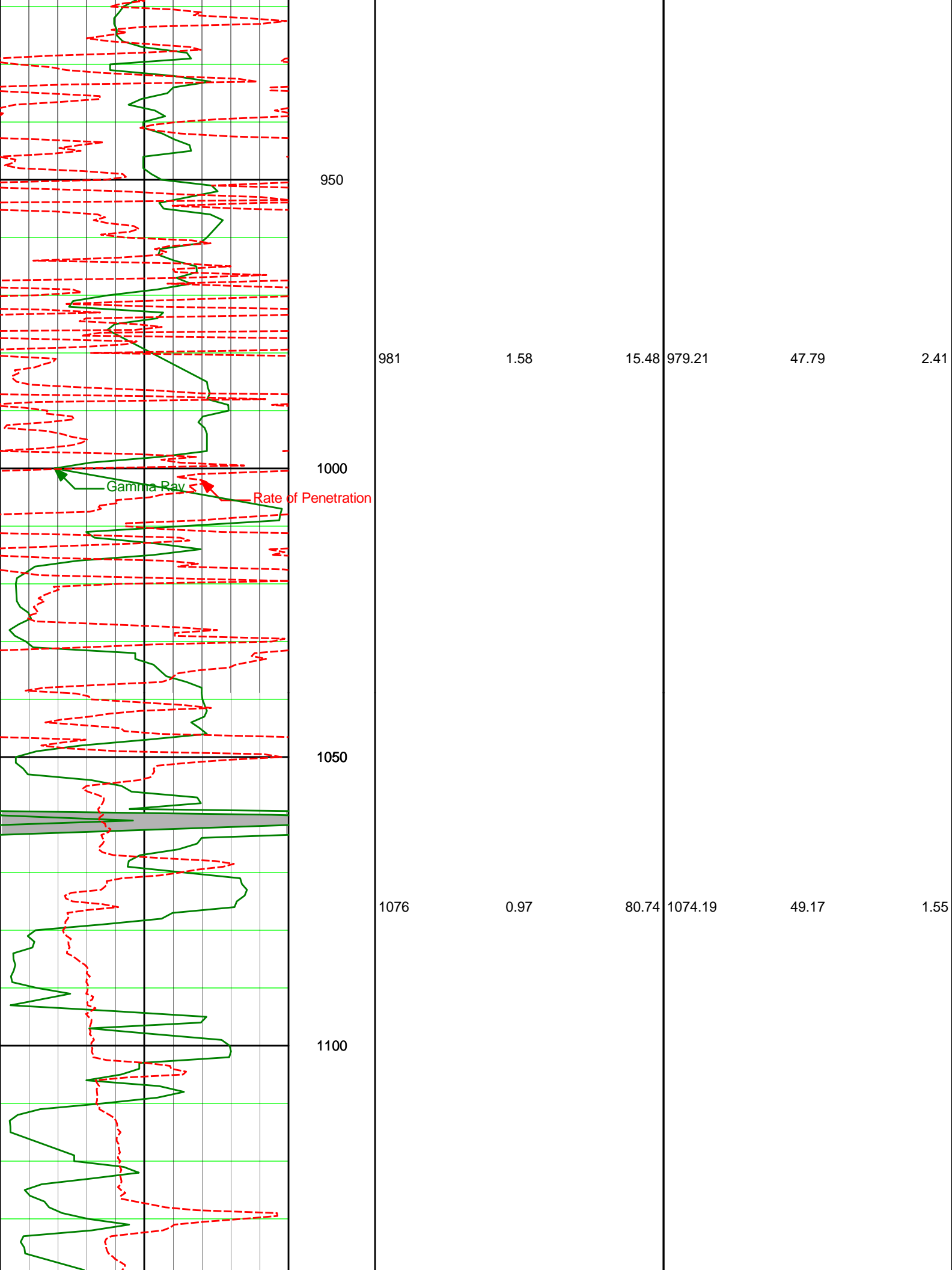
REMARKS

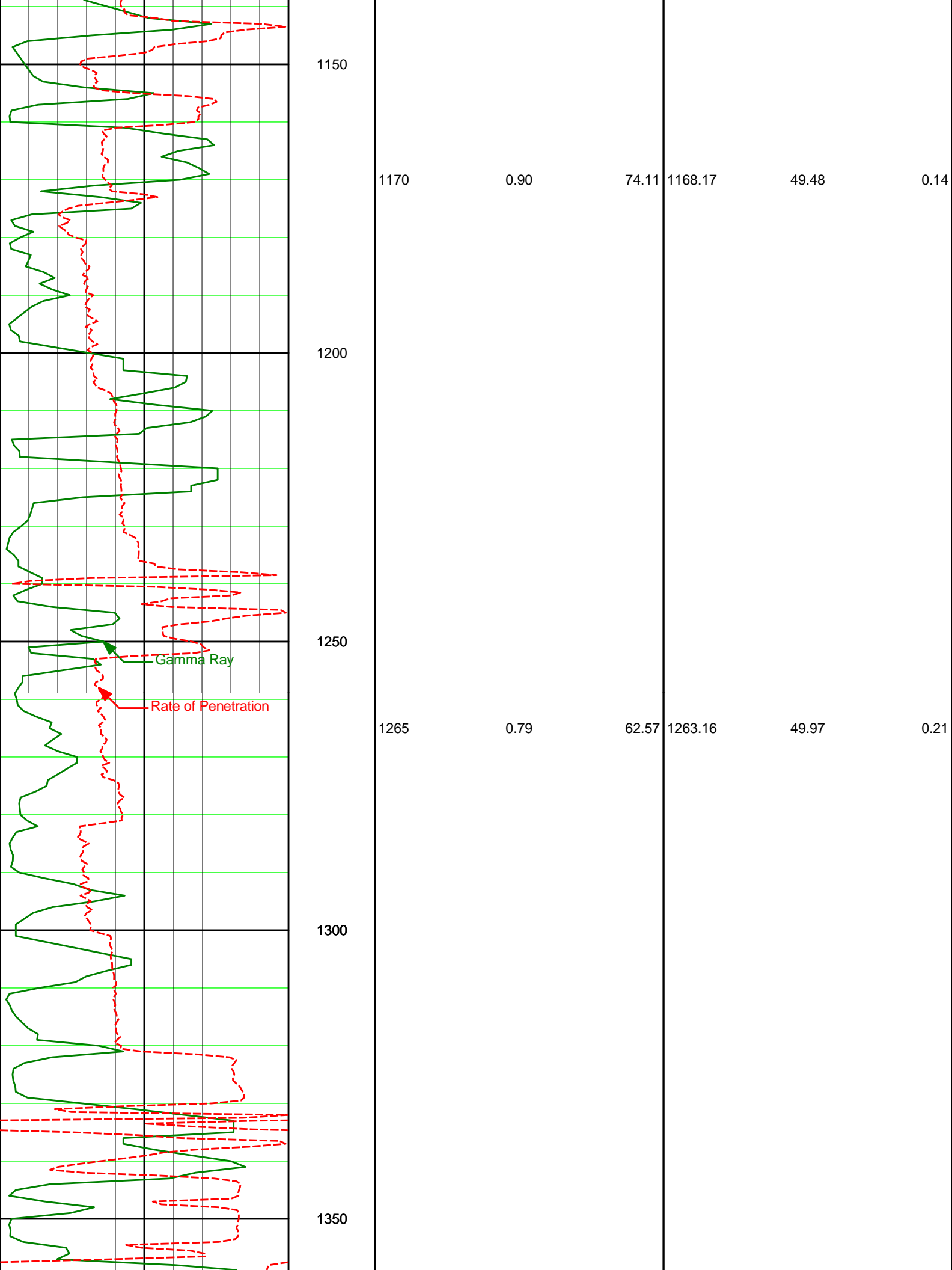
1. All depths are calibrated to the driller's pipe tally and are measured from the rotary table.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
4. The following smoothing parameters have been applied to the data:
 - ROP: 1.0 ft interval, 3.0 ft coercion distance.
 - GAMMA: 0.5 ft interval, 0.6 ft coercion distance.
5. Runs 400 and 500 were reamer runs only, no MWD.

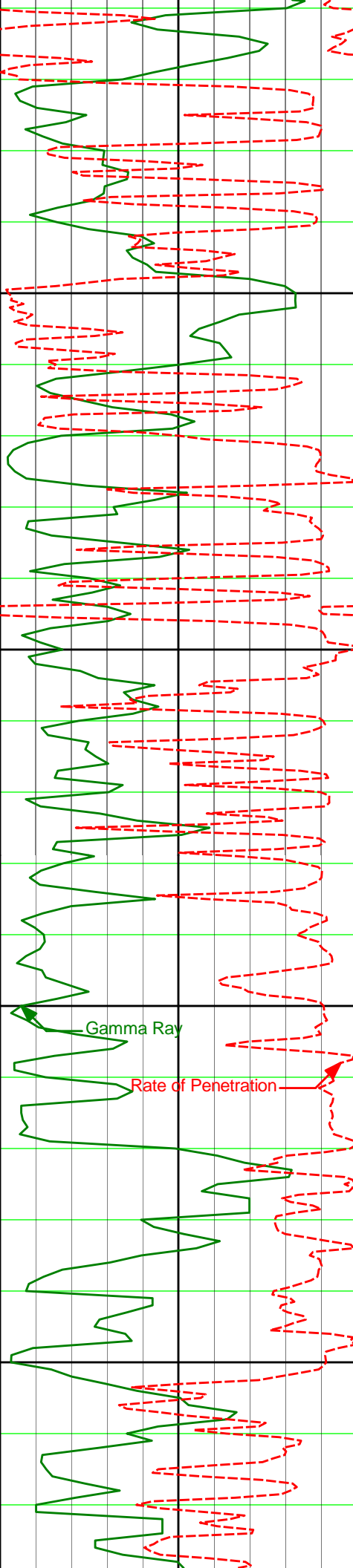
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1400

1450

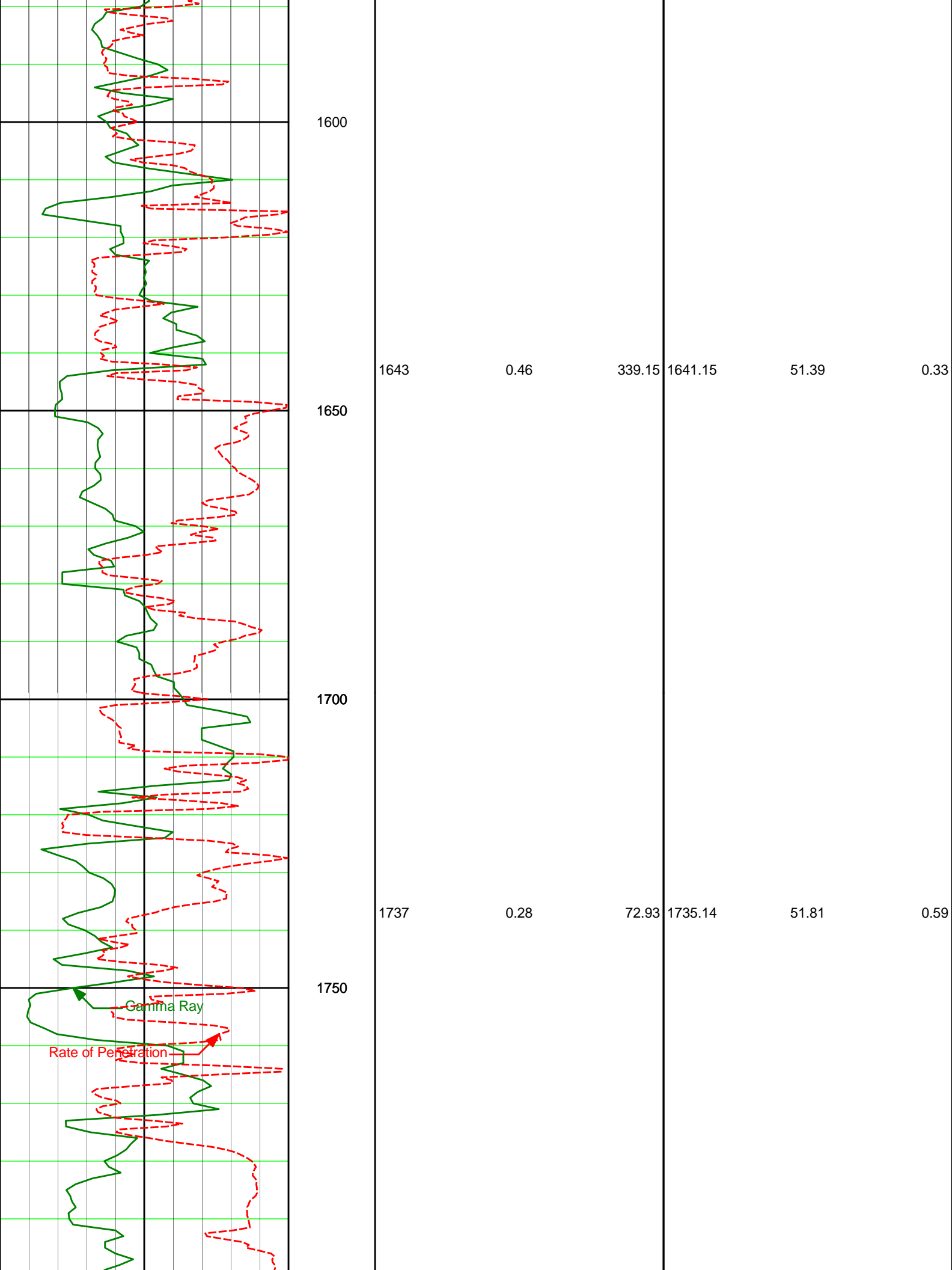
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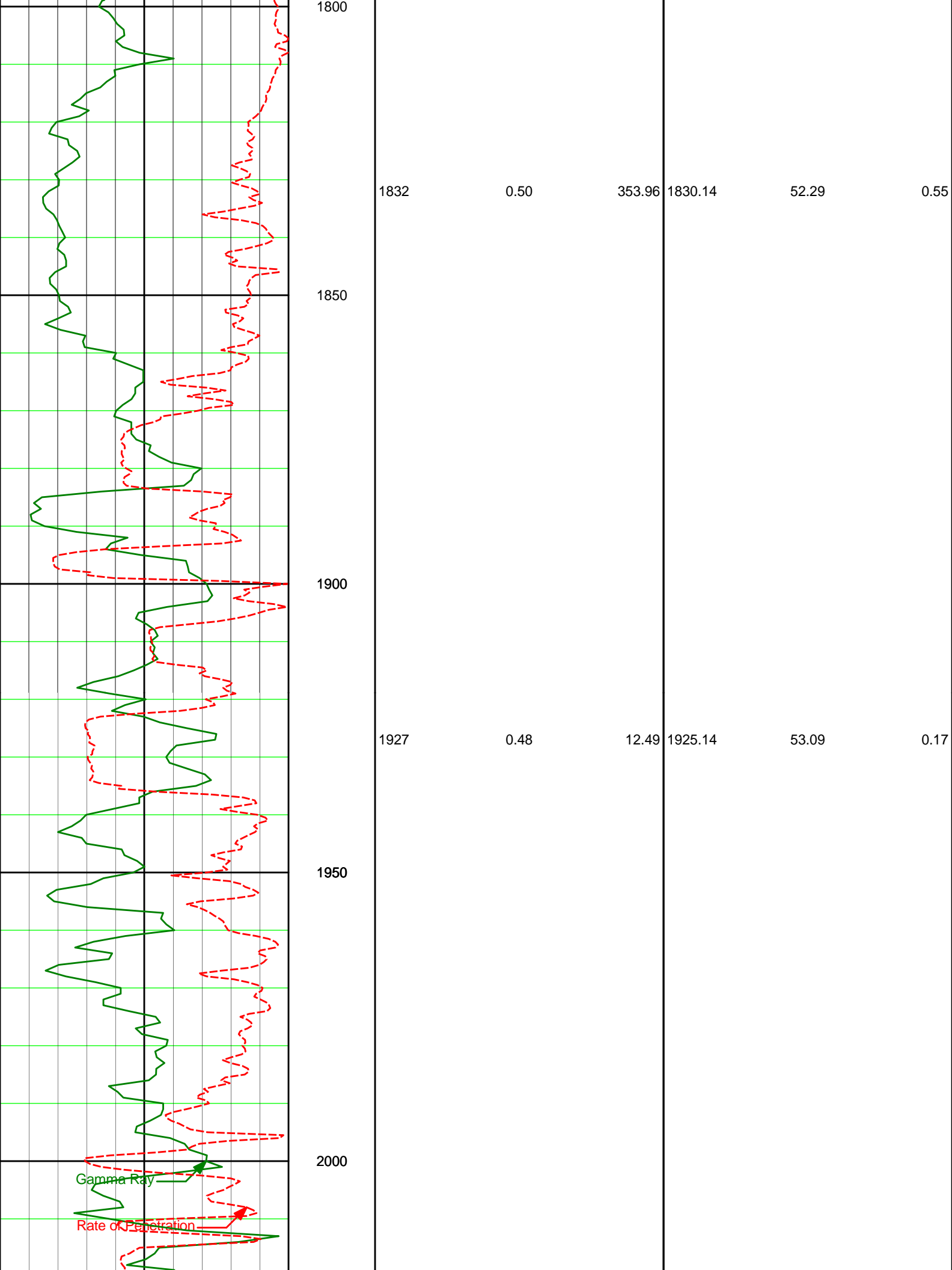
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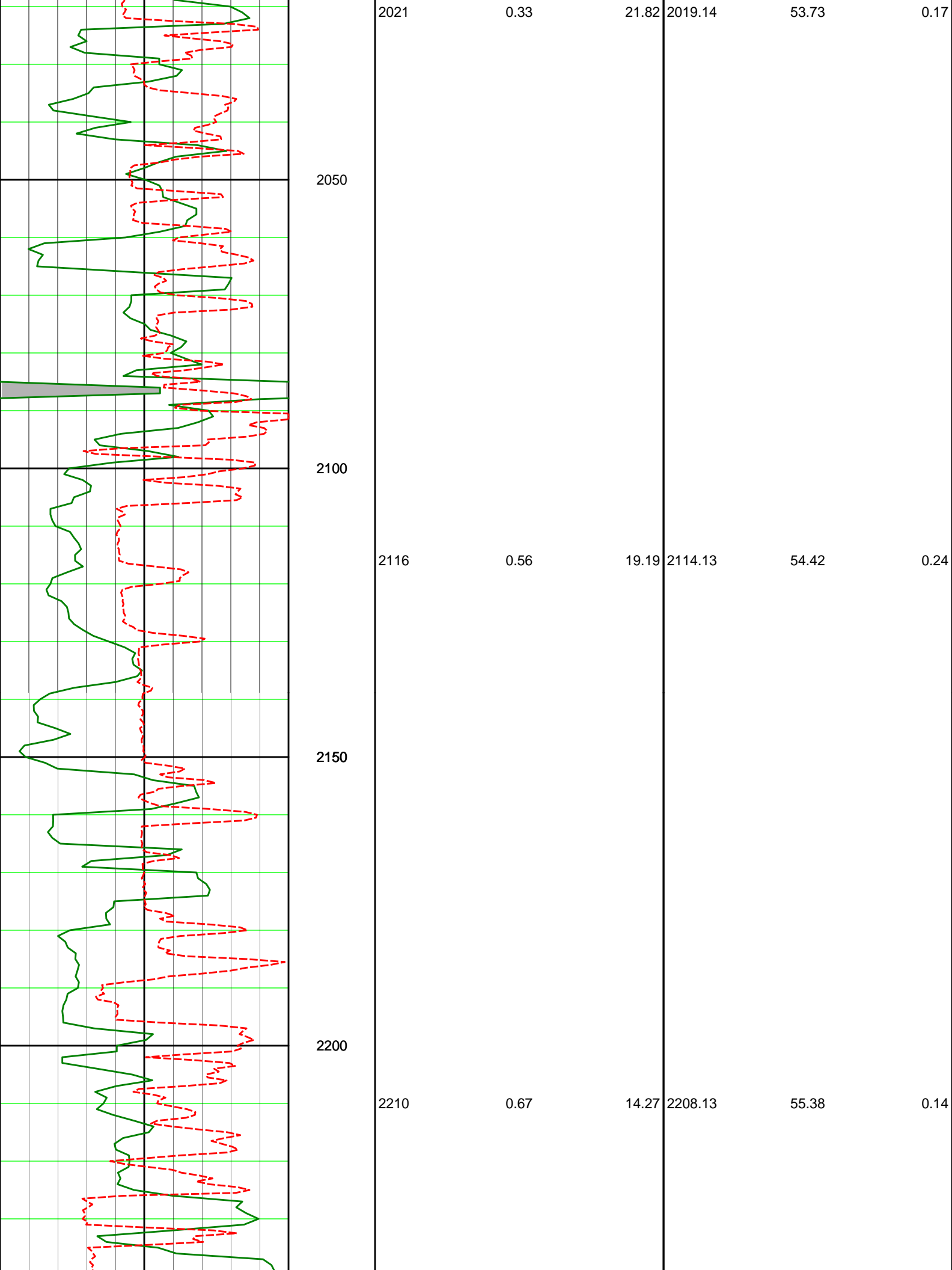
Gamma Ray

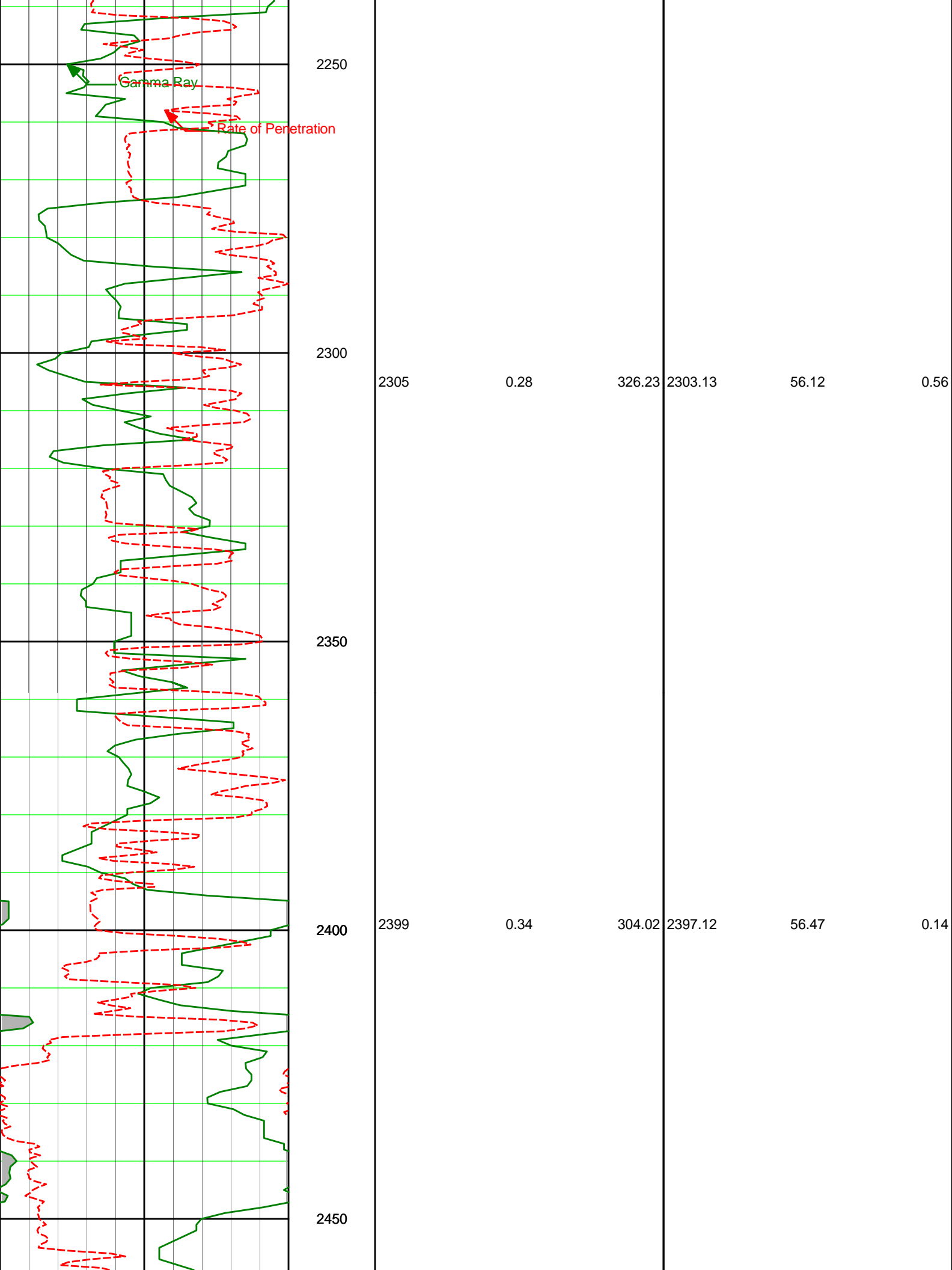
Rate of Penetration

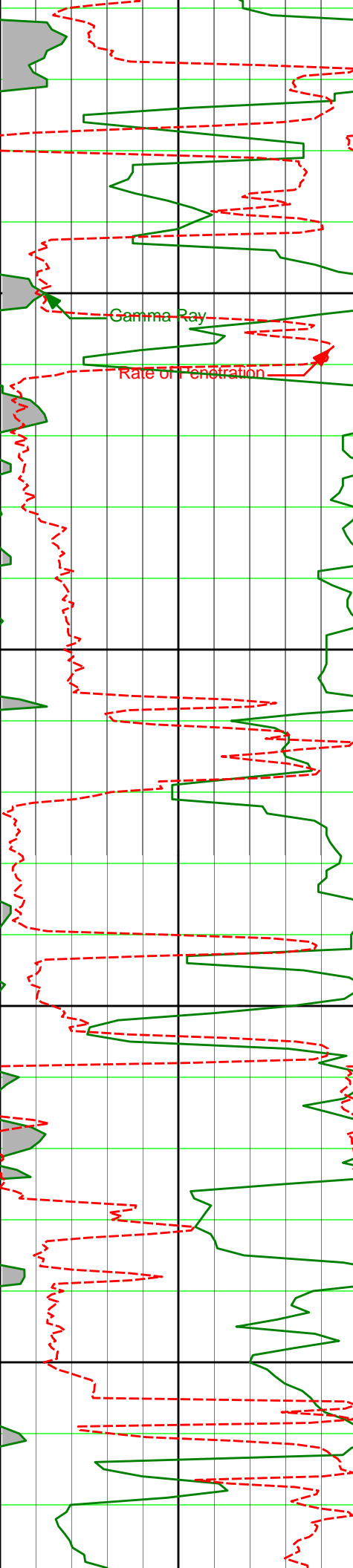
1339	0.63	63.64	1337.13	50.36	0.03
1454	0.46	96.11	1452.15	50.81	0.53
1548	0.17	1.56	1546.15	50.90	0.53











2494
2500
2550
2588
2600
2650

2494
2588

0.37
0.33

348.26
112.38

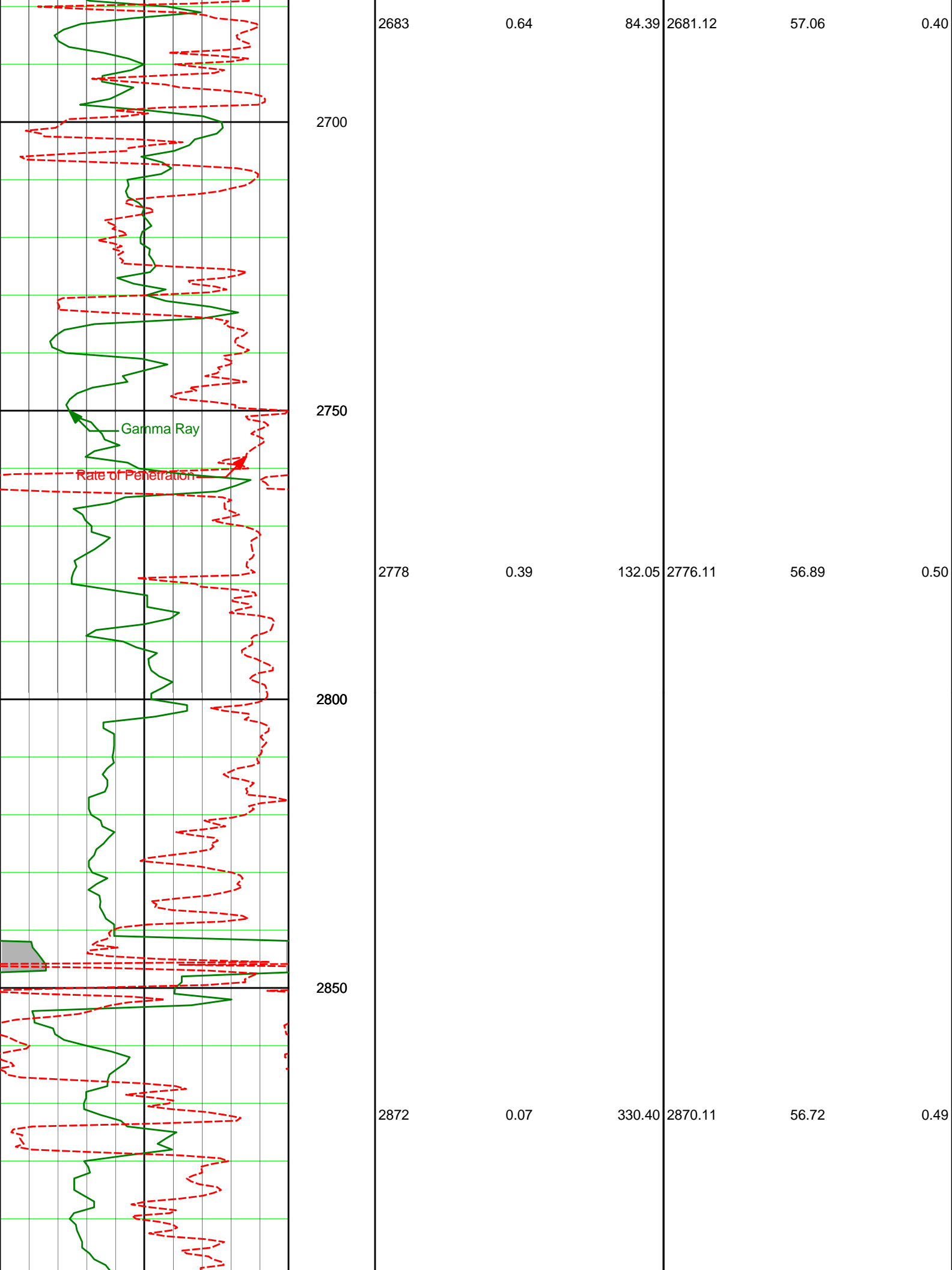
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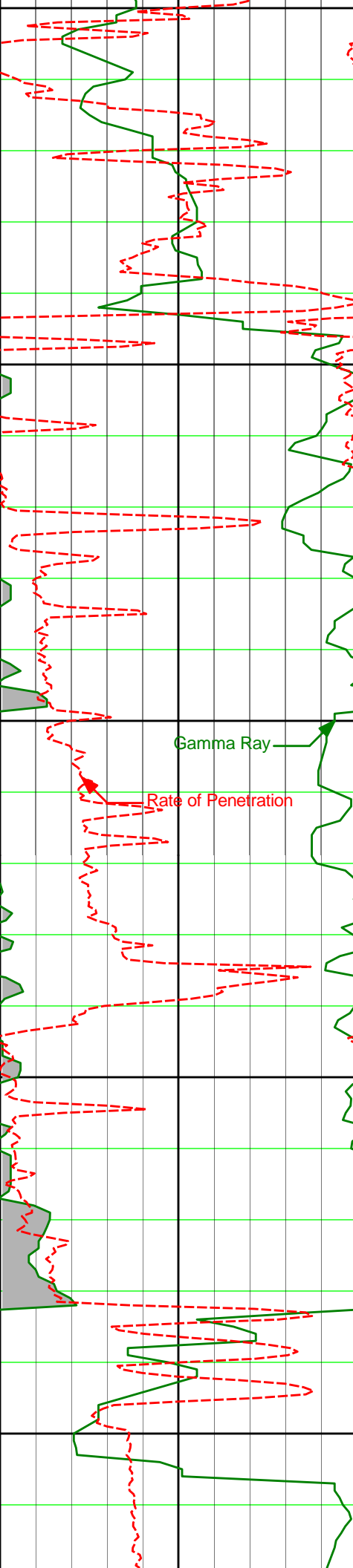
56.93
57.12

0.28
0.66

Gamma Ray

Rate of Penetration





2900

2950

3000

3050

3100

2967

0.25

241.42

2965.11

56.67

0.28

Gamma Ray

Rate of Penetration

3061

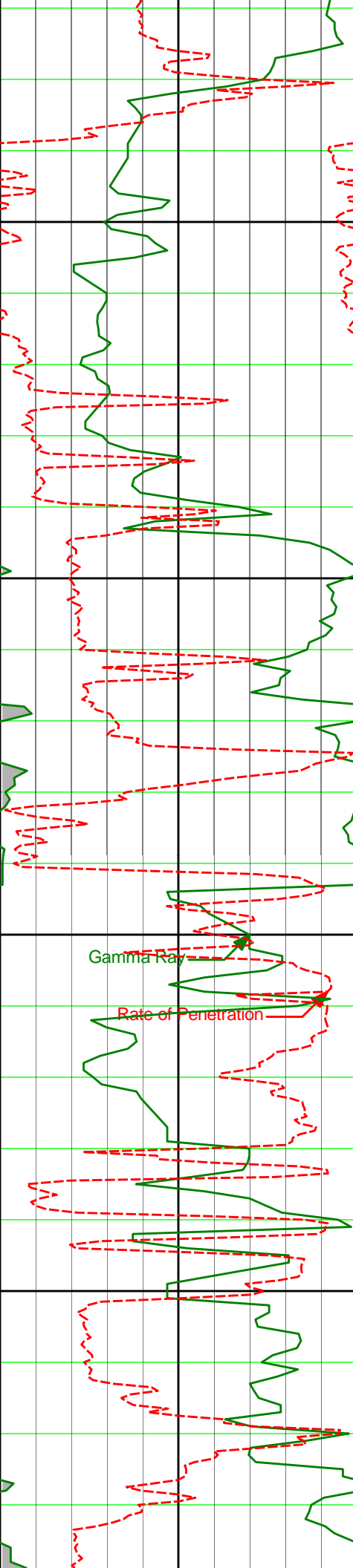
0.31

213.97

3059.11

56.36

0.15



3150

3200

3250

3300

Gamma Ray

Rate of Penetration

3156

0.69

212.75

3154.11

55.67

0.39

3250

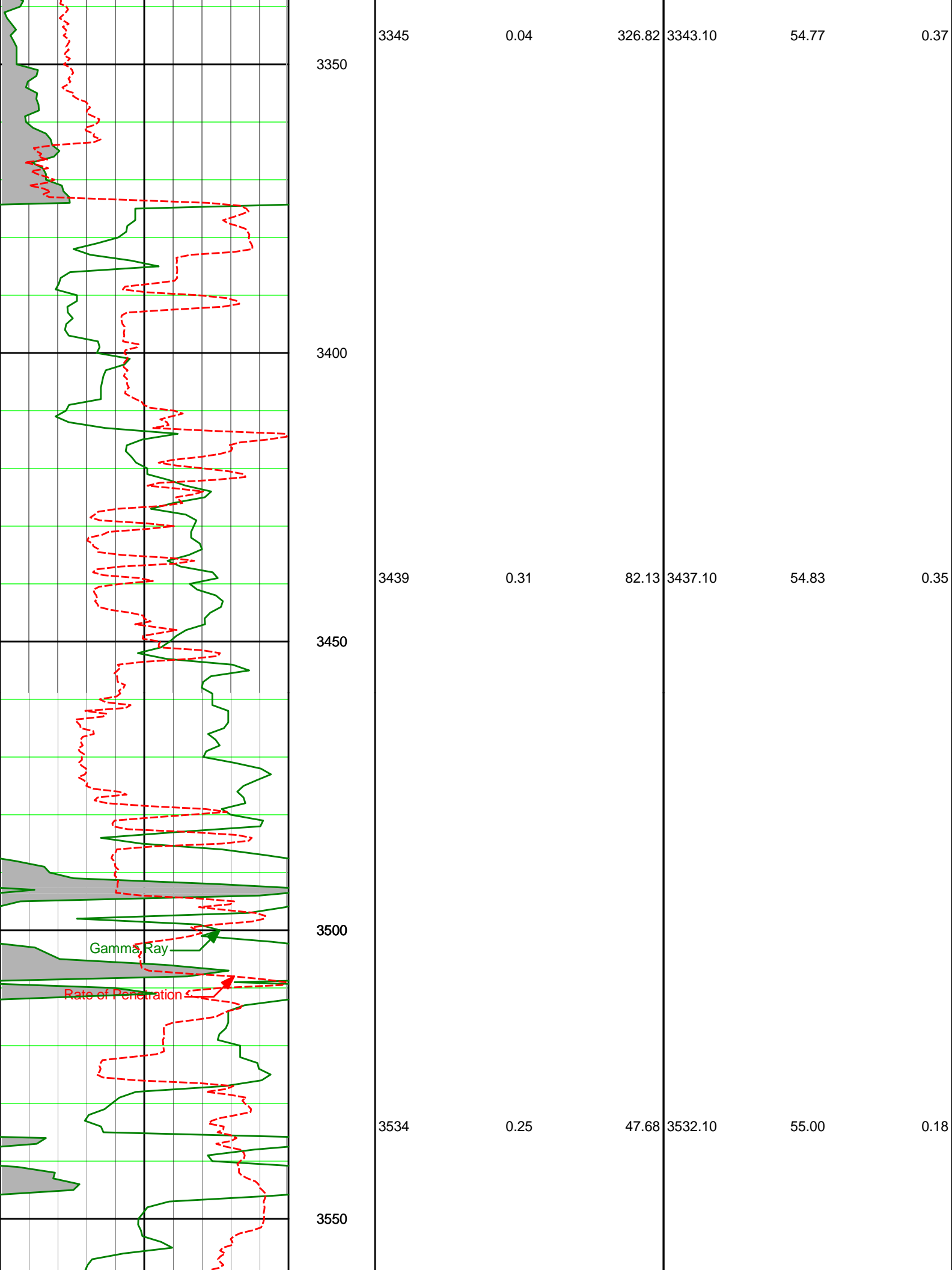
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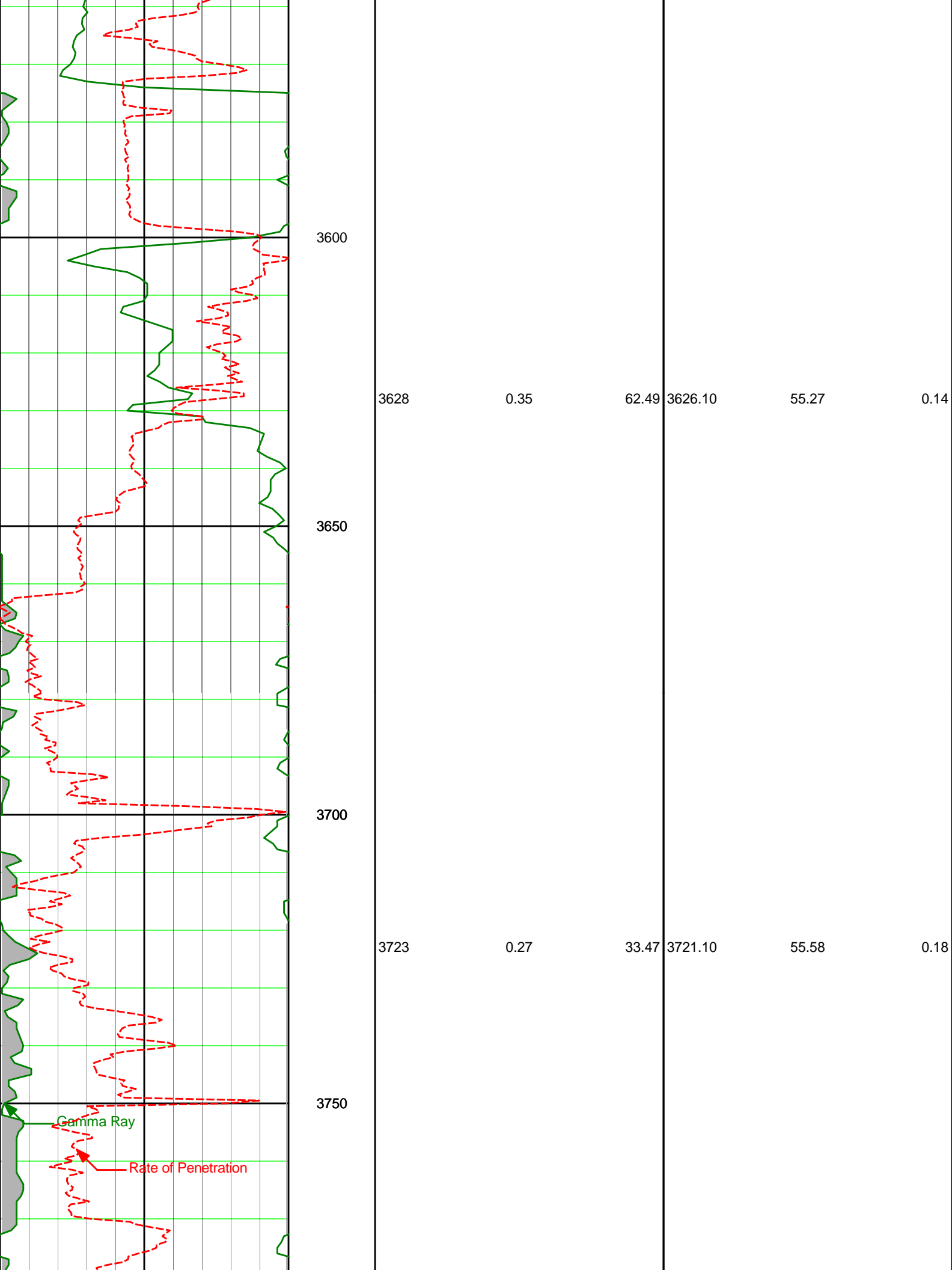
157.23

3248.11

54.97

0.61





3600

3628

0.35

62.49

3626.10

55.27

0.14

3650

3700

3723

0.27

33.47

3721.10

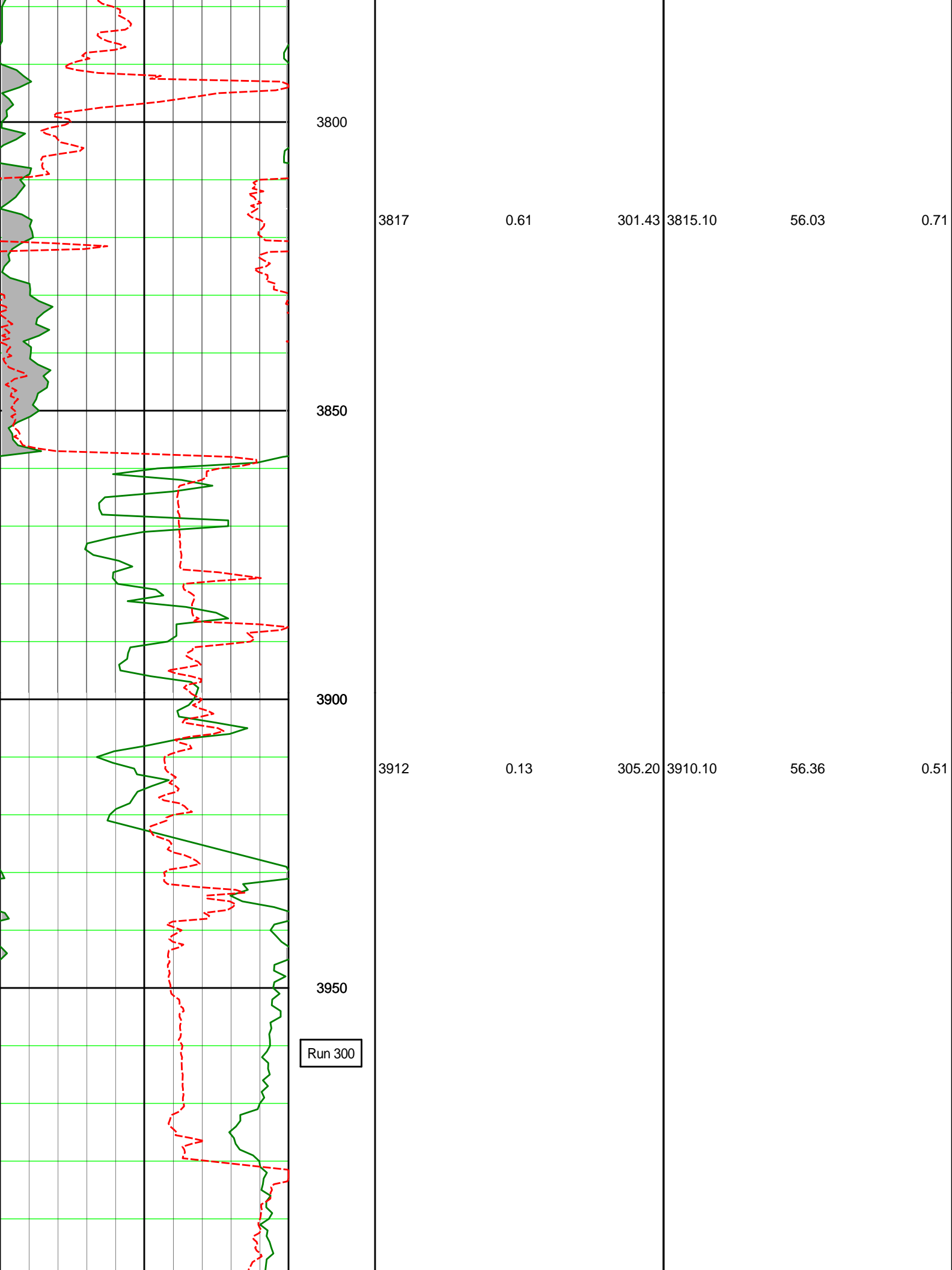
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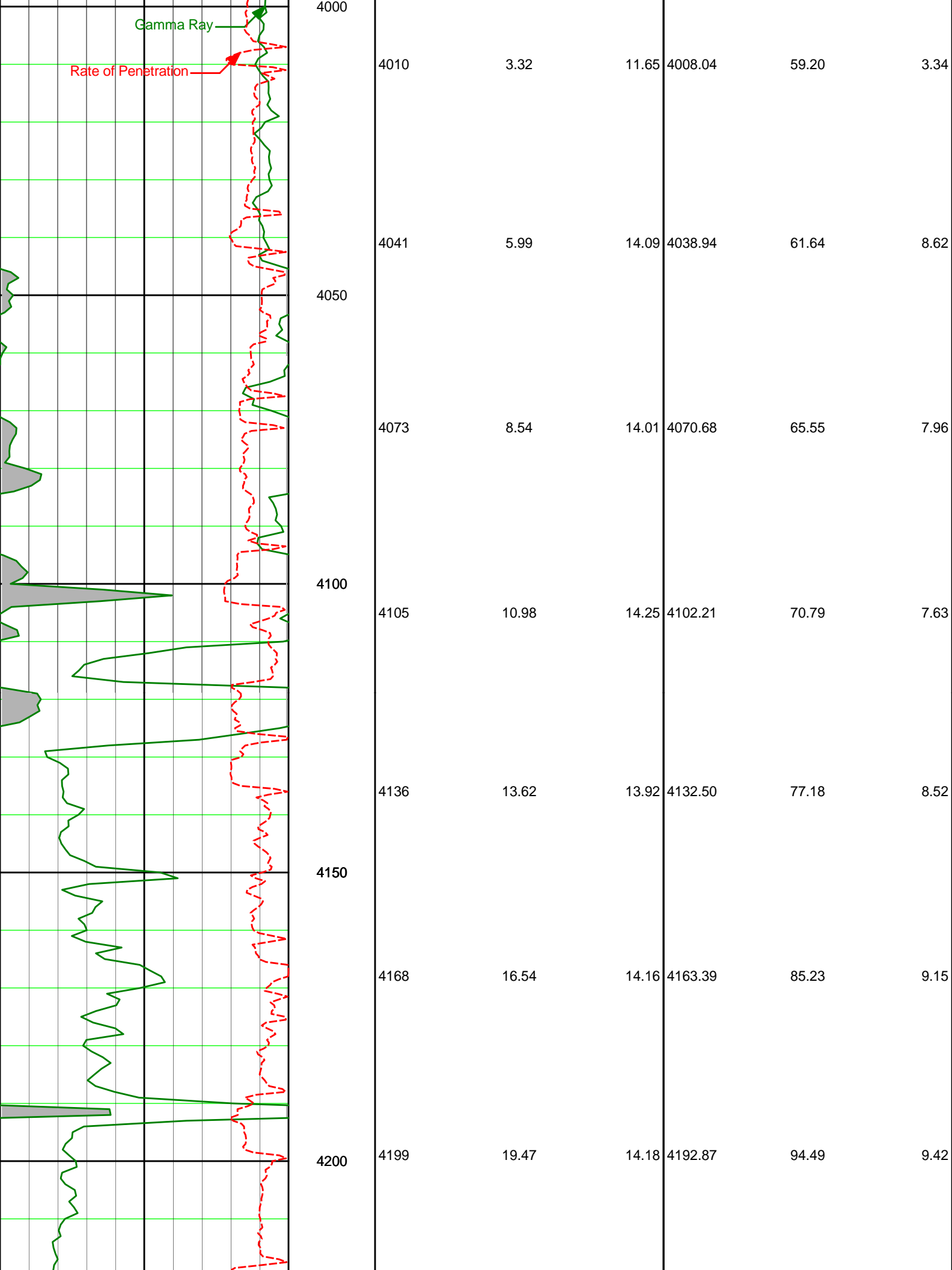
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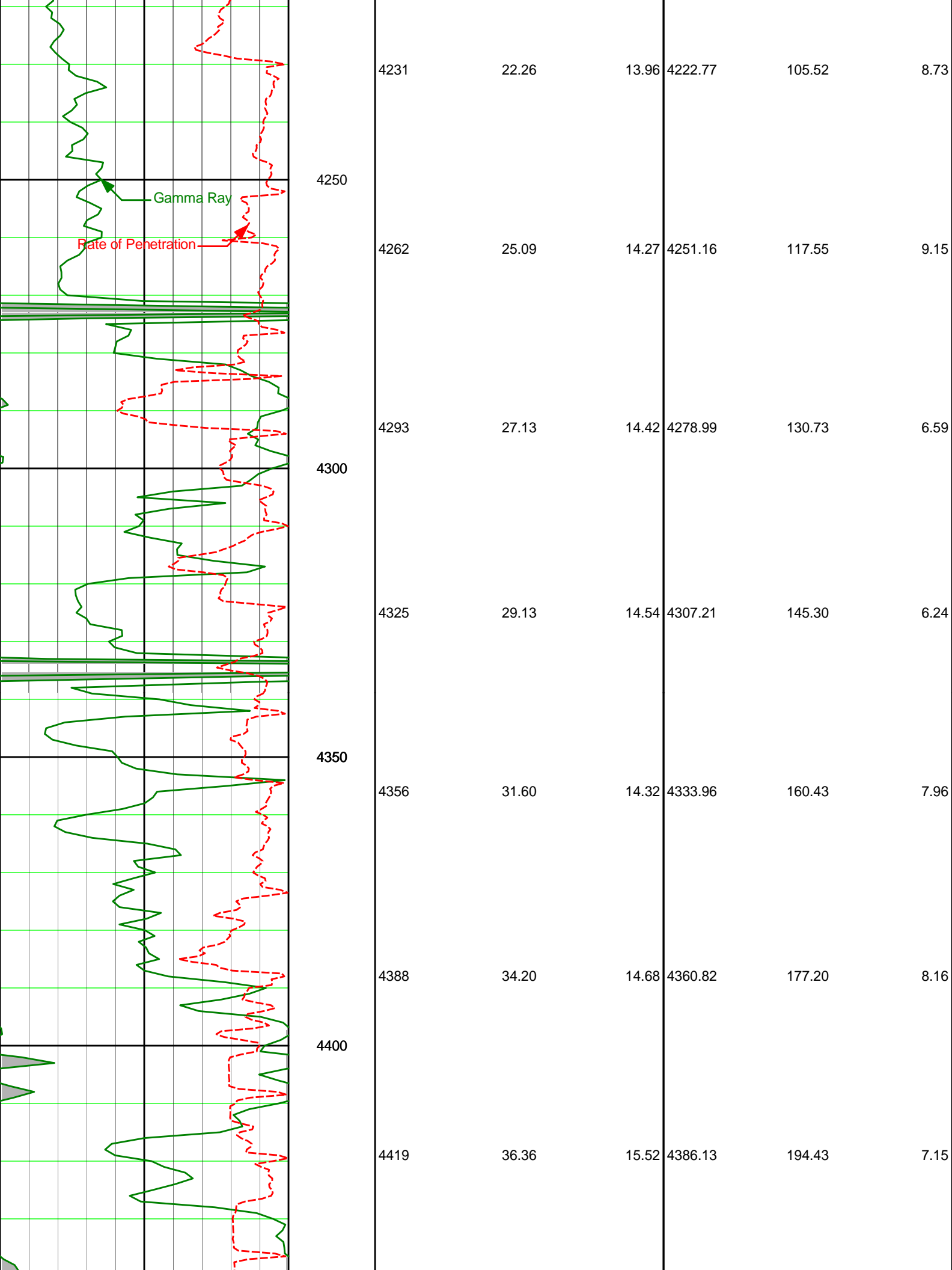
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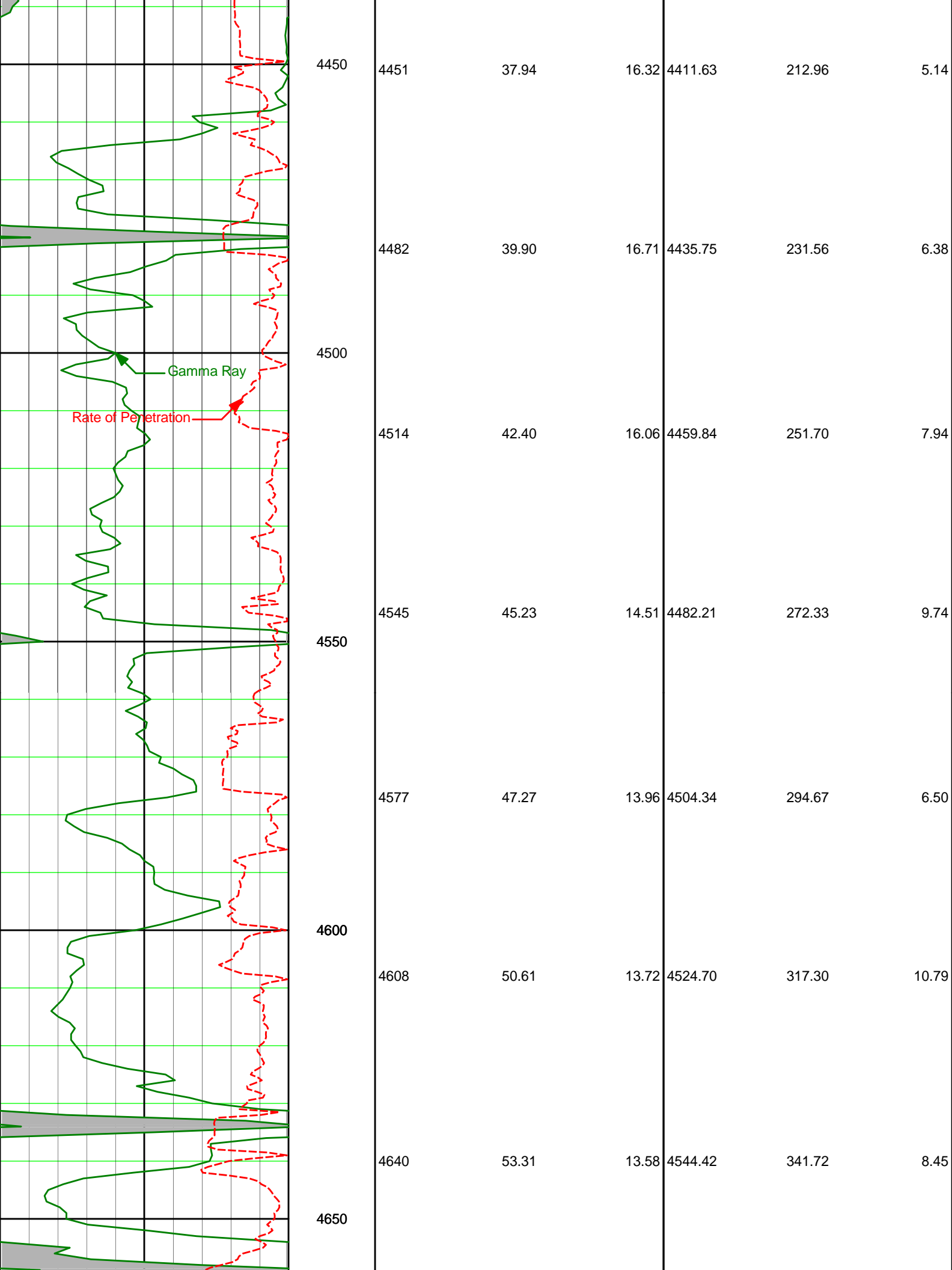
Gamma Ray

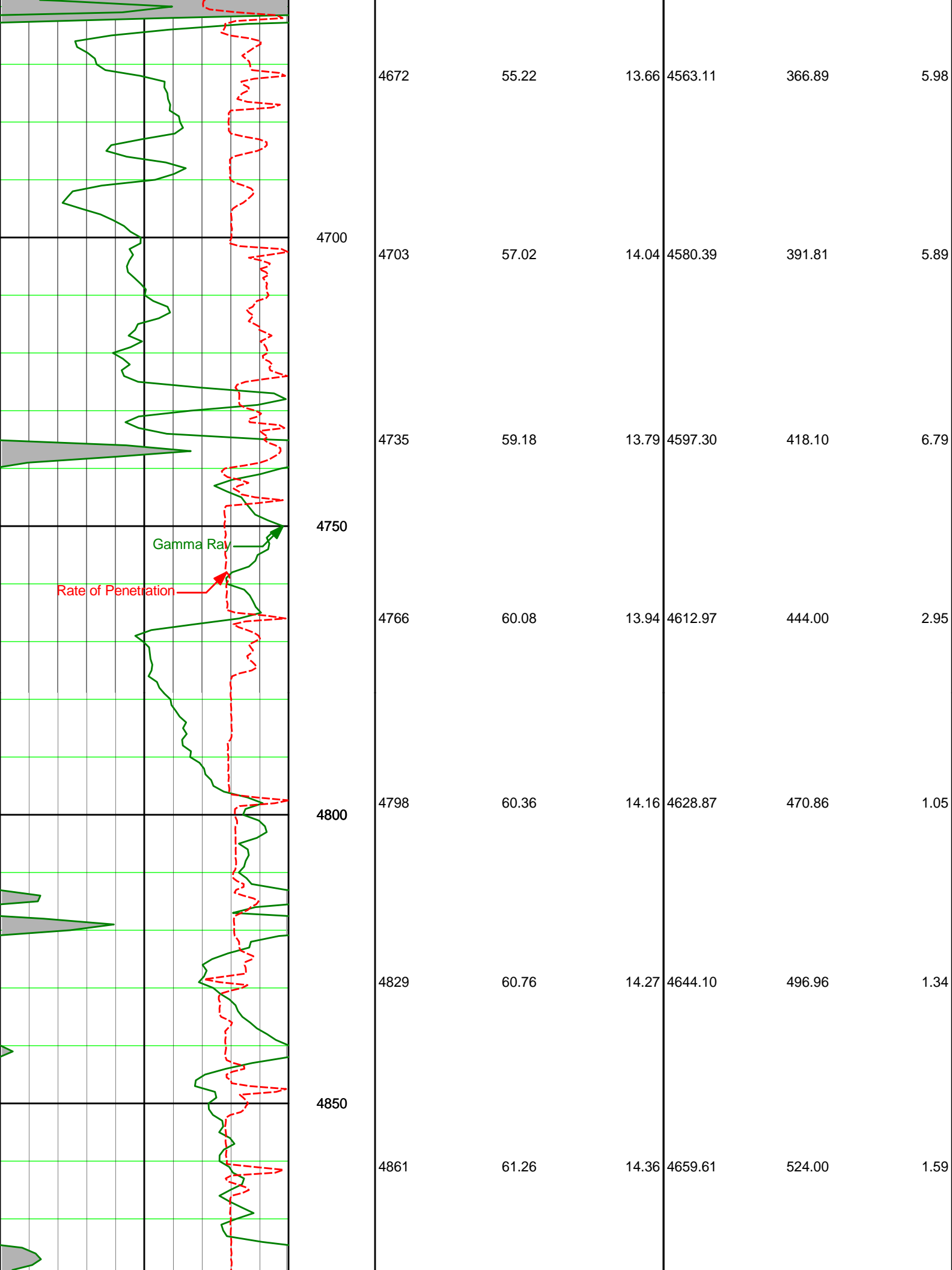
Rate of Penetration

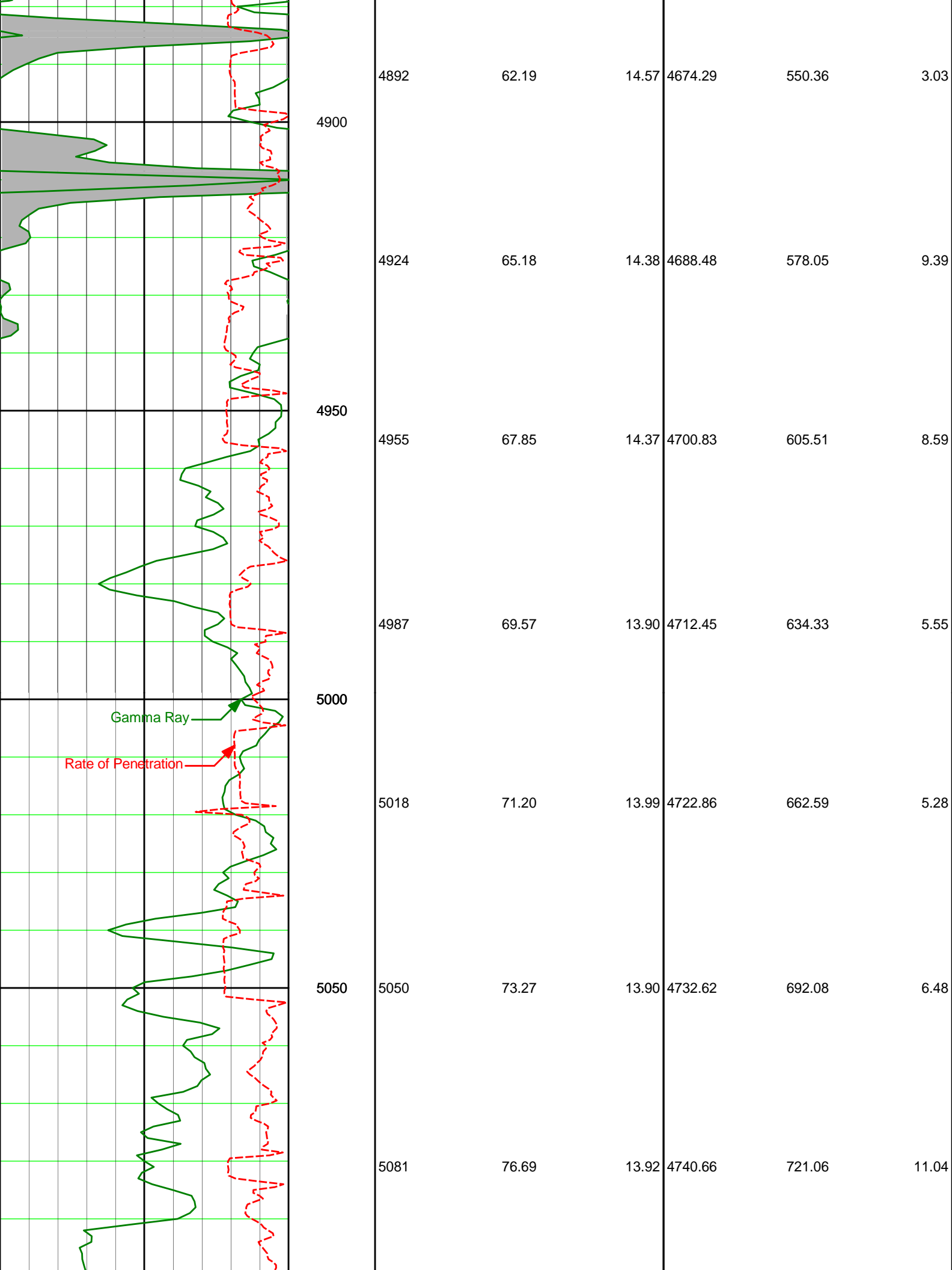


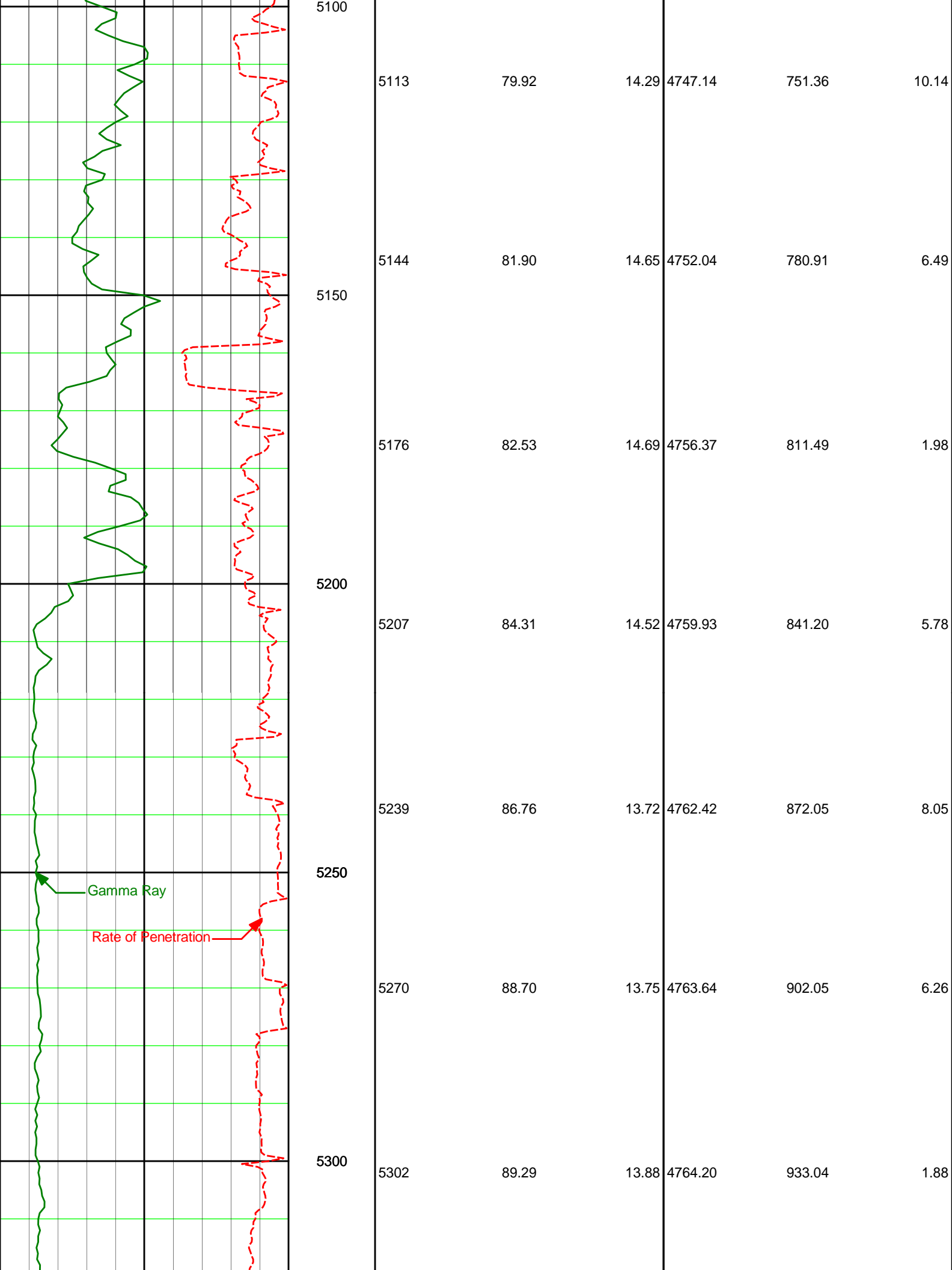


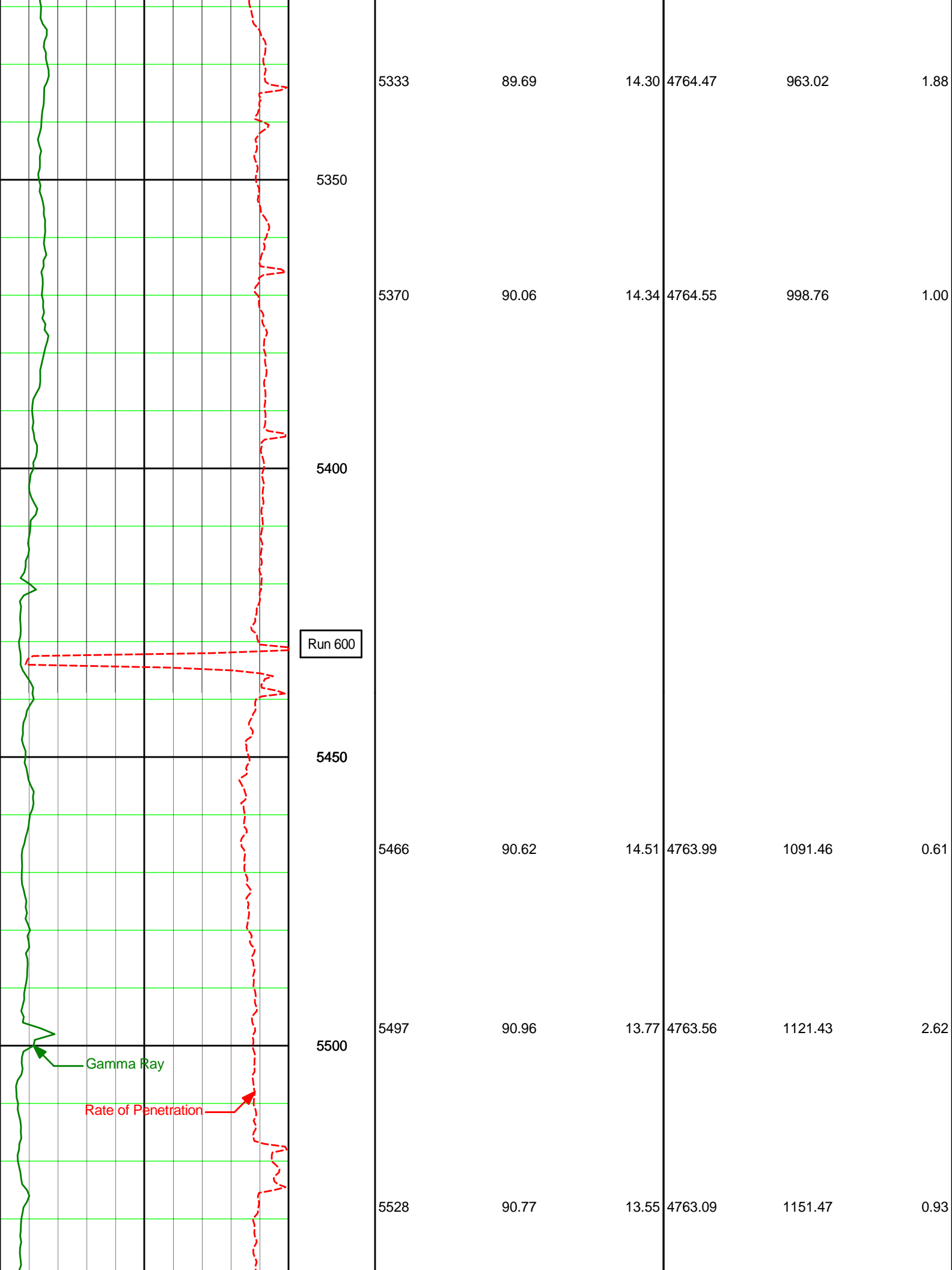












Run 600

Gamma Ray

Rate of Penetration

5333

89.69

14.30

4764.47

963.02

1.88

5350

5370

90.06

14.34

4764.55

998.76

1.00

5400

5450

5466

90.62

14.51

4763.99

1091.46

0.61

5500

5497

90.96

13.77

4763.56

1121.43

2.62

5528

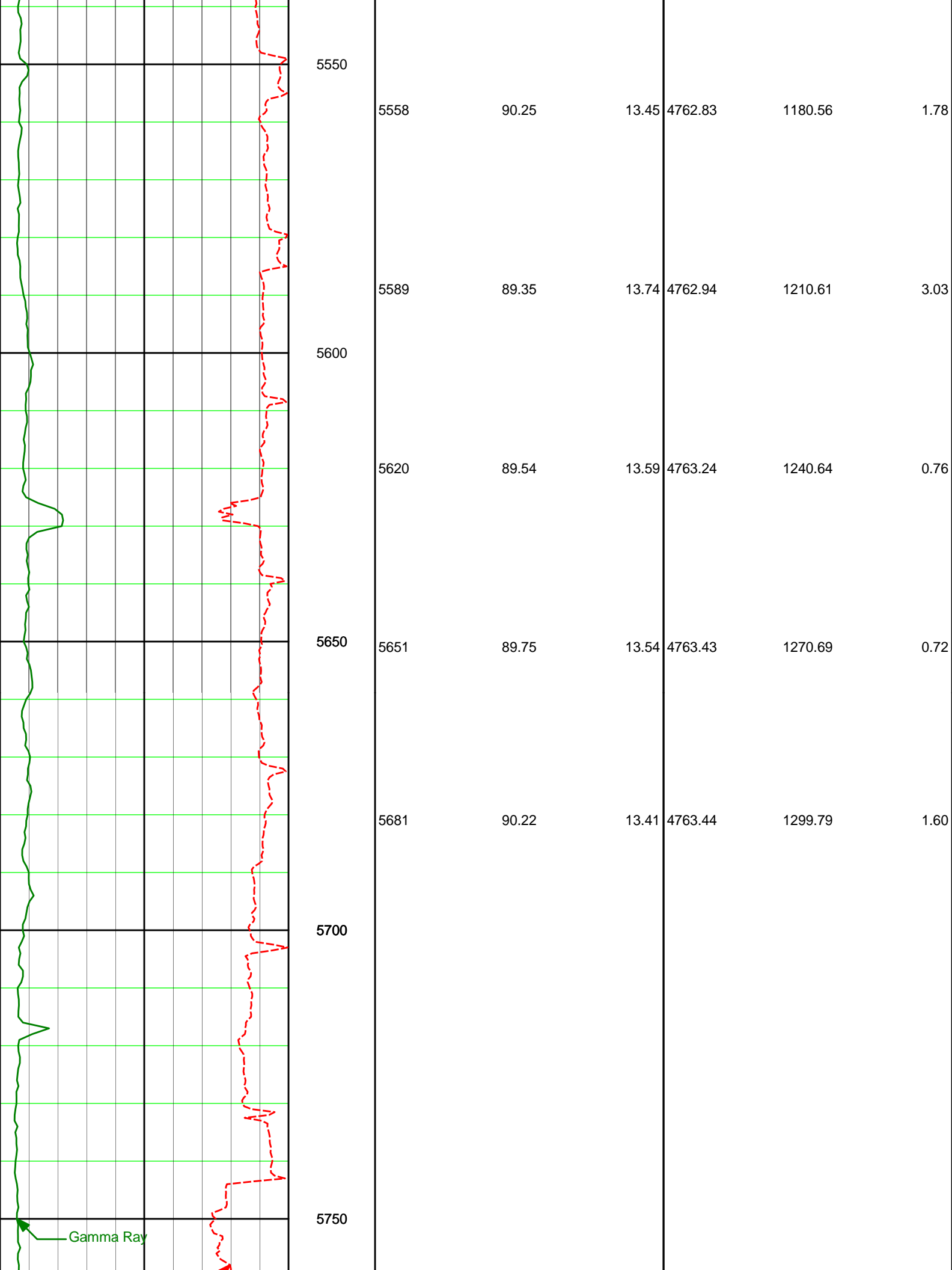
90.77

13.55

4763.09

1151.47

0.93



5550

5558

90.25

13.45

4762.83

1180.56

1.78

5589

89.35

13.74

4762.94

1210.61

3.03

5600

5620

89.54

13.59

4763.24

1240.64

0.76

5650

5651

89.75

13.54

4763.43

1270.69

0.72

5681

90.22

13.41

4763.44

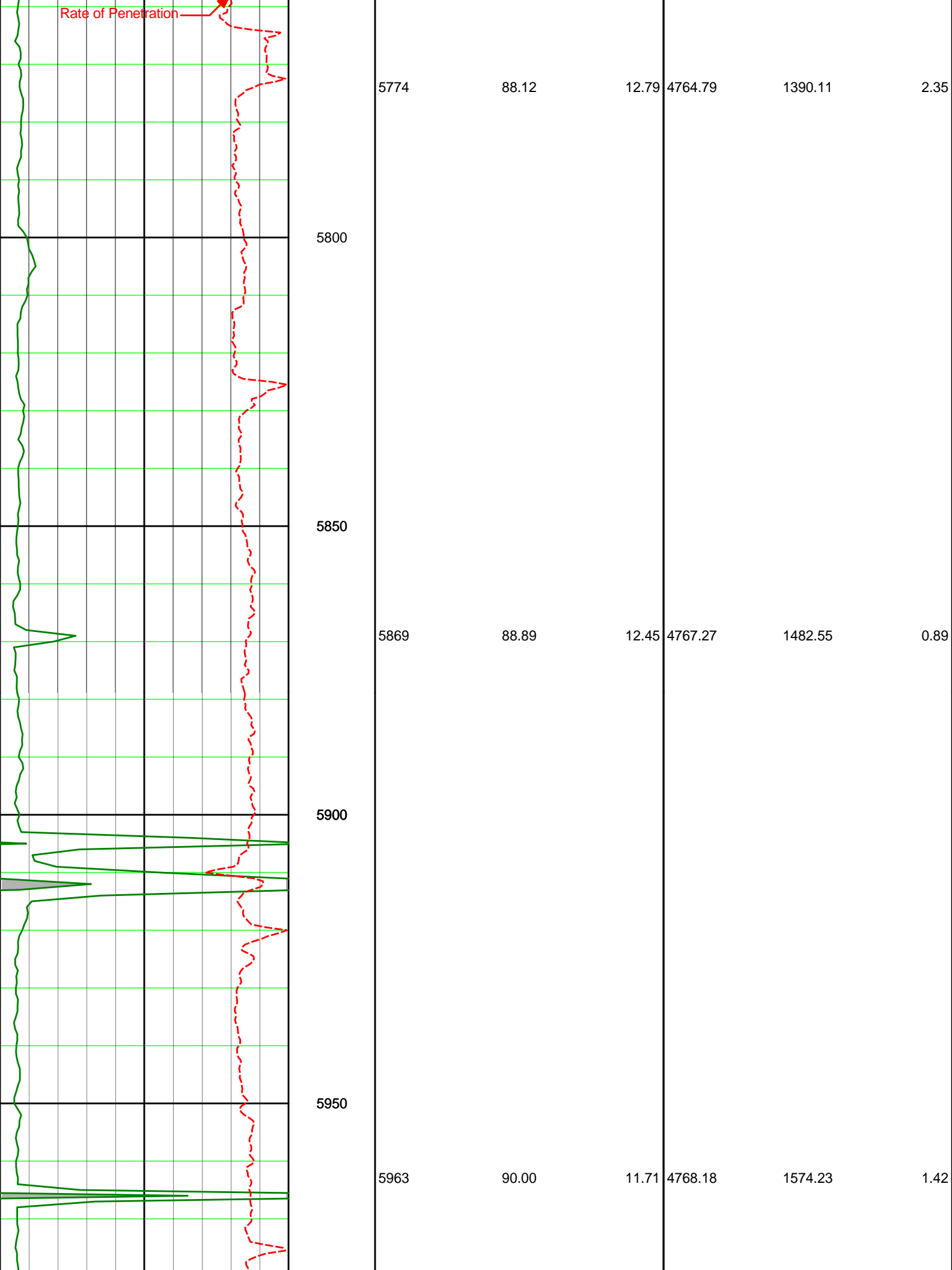
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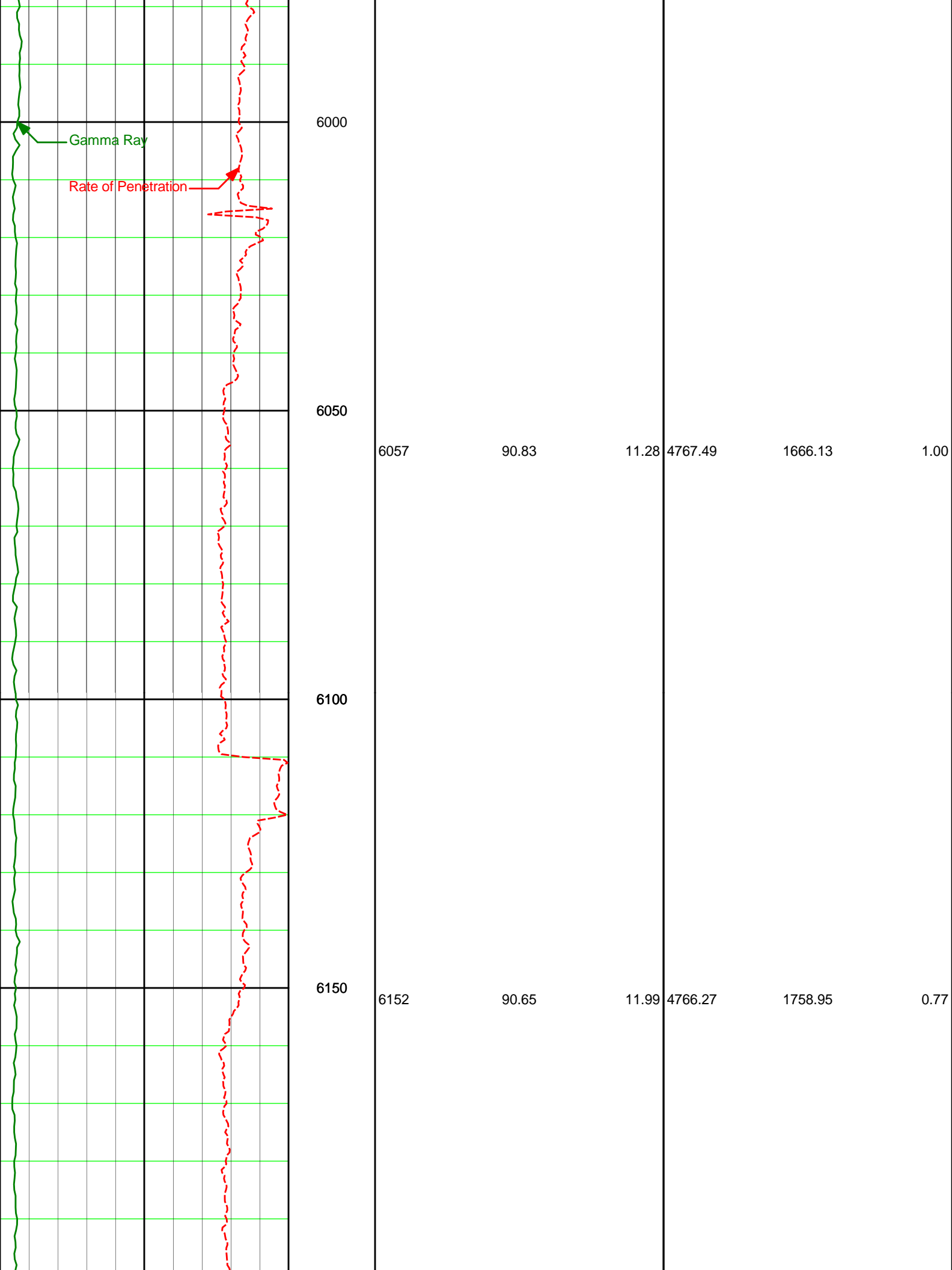
1.60

5700

5750

Gamma Ray





Gamma Ray

Rate of Penetration

6000

6050

6100

6150

6057

90.83

11.28

4767.49

1666.13

1.00

6152

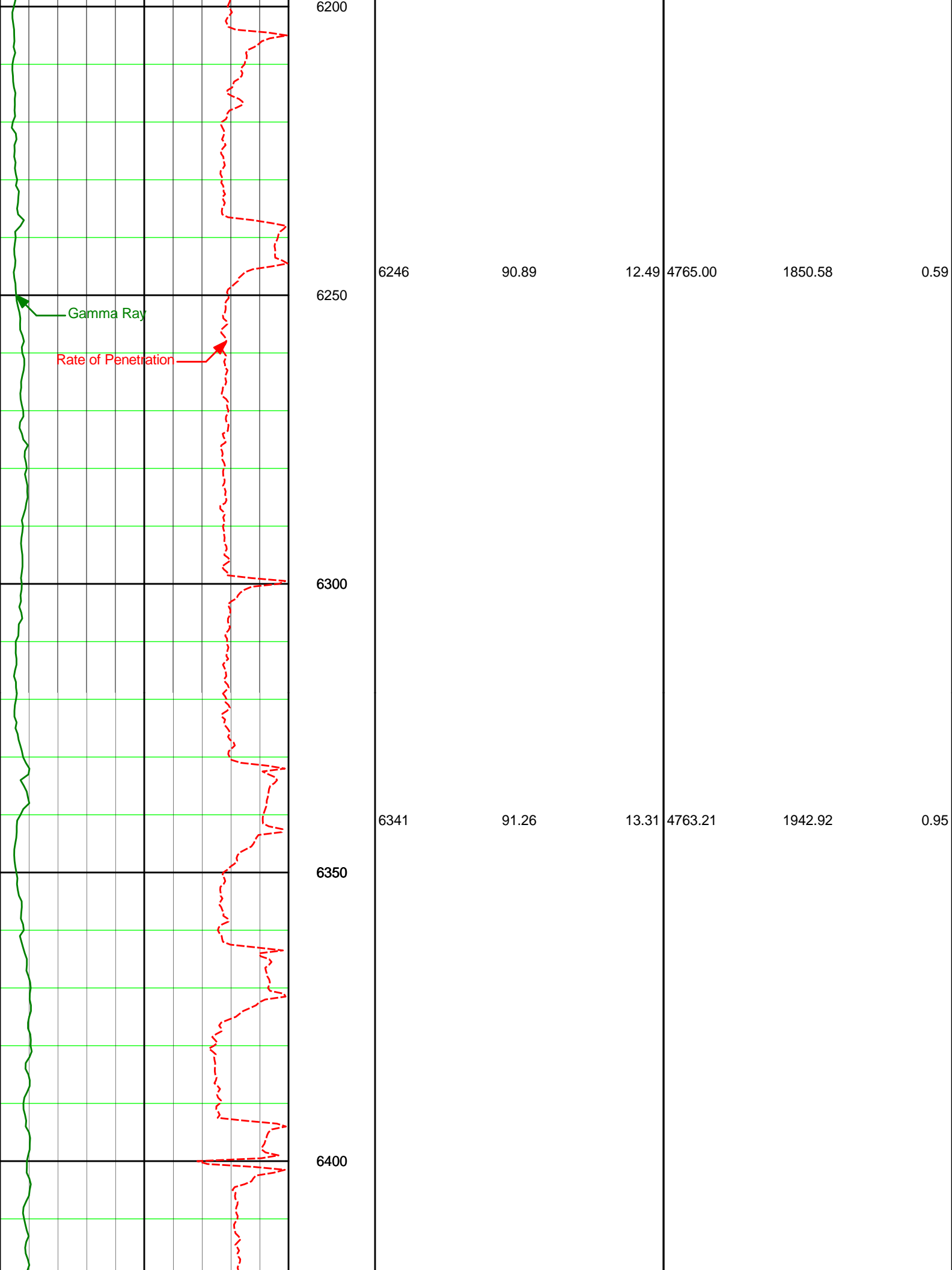
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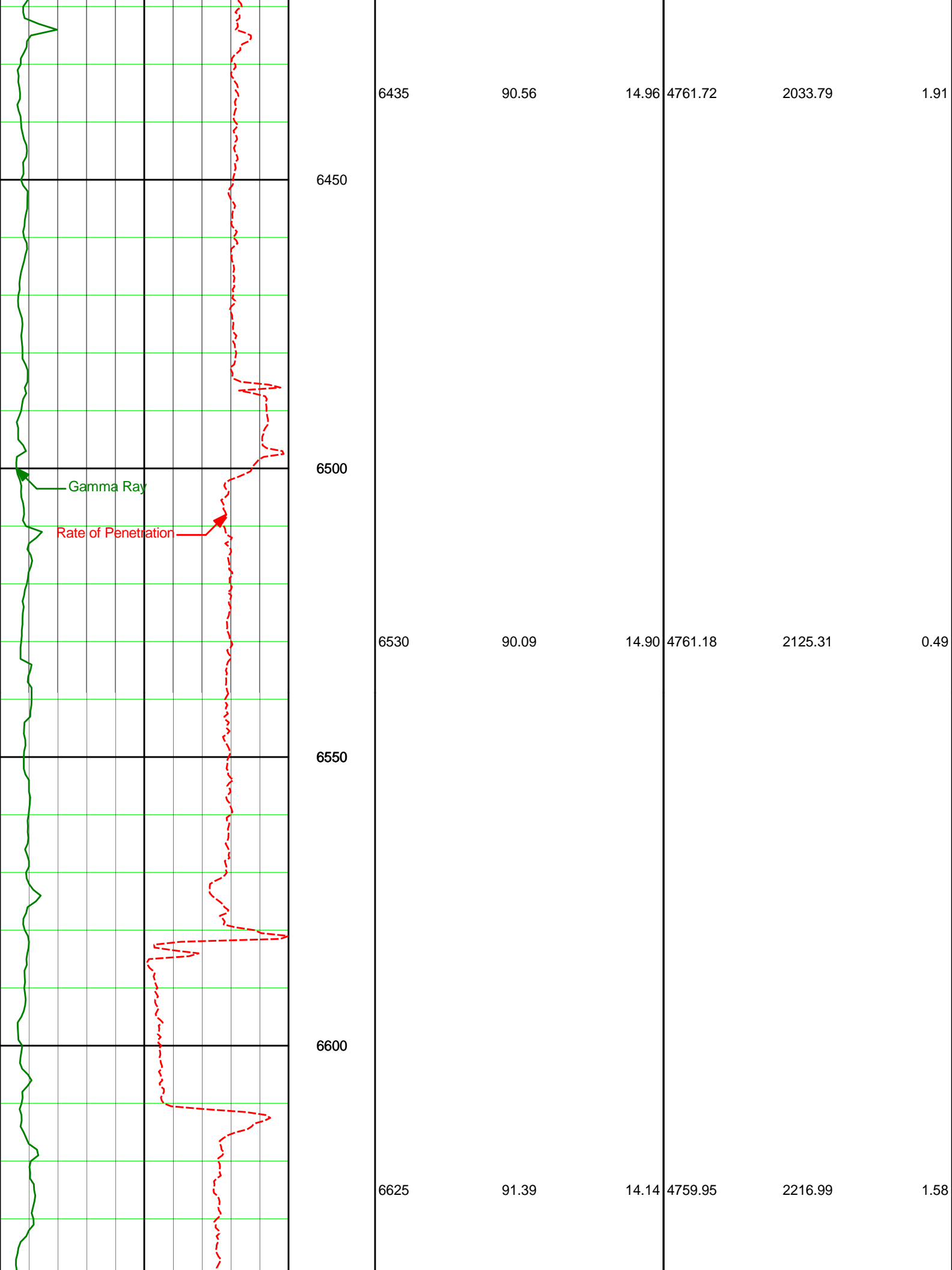
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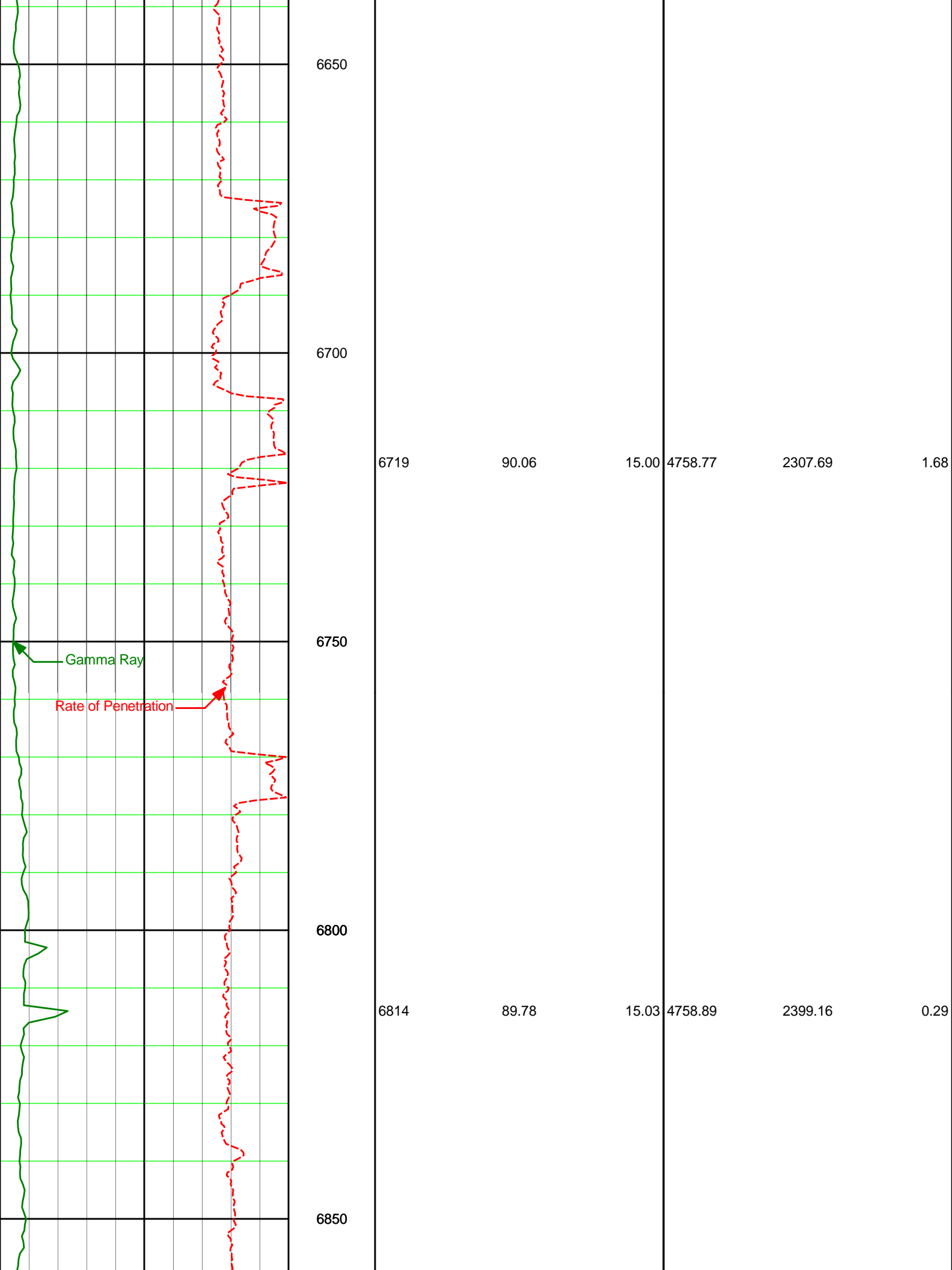
4766.27

1758.95

0.77







6650

6700

6750

6800

6850

6719

90.06

15.00

4758.77

2307.69

1.68

6814

89.78

15.03

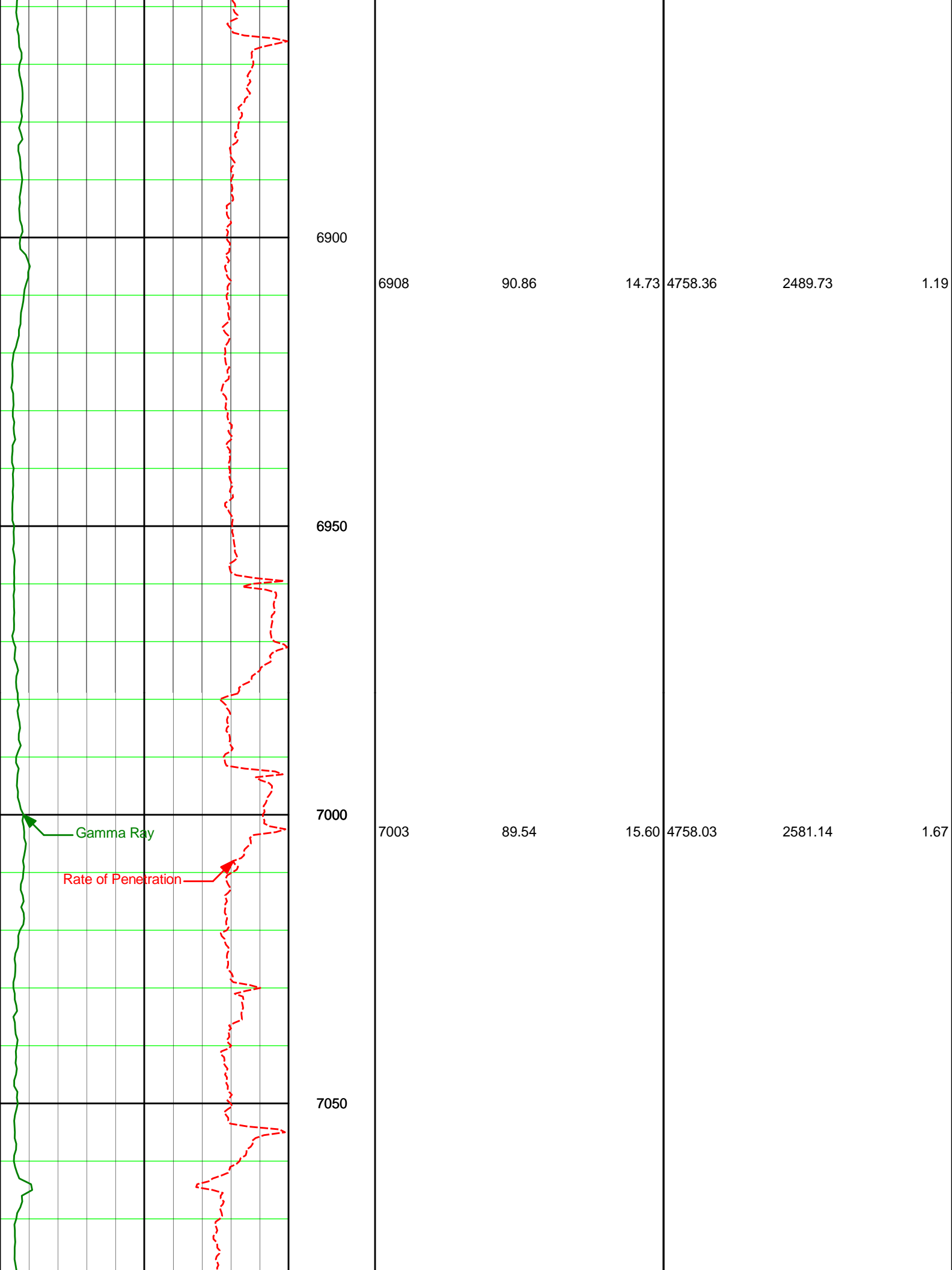
4758.89

2399.16

0.29

Gamma Ray

Rate of Penetration



6900

6908

90.86

14.73

4758.36

2489.73

1.19

6950

7000

7003

89.54

15.60

4758.03

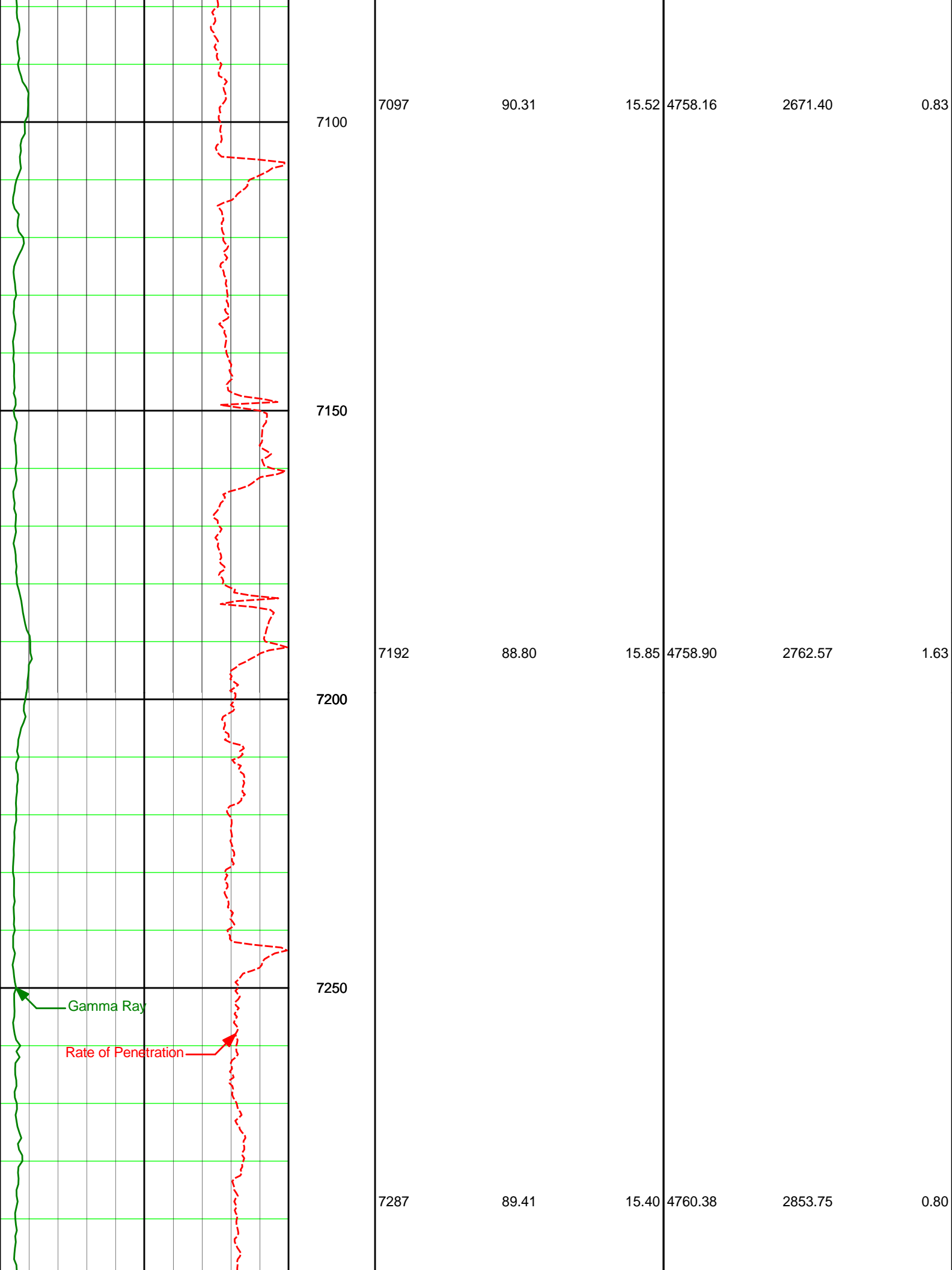
2581.14

1.67

7050

Gamma Ray

Rate of Penetration



7100

7097

90.31

15.52

4758.16

2671.40

0.83

7150

7200

7250

7192

88.80

15.85

4758.90

2762.57

1.63

7287

89.41

15.40

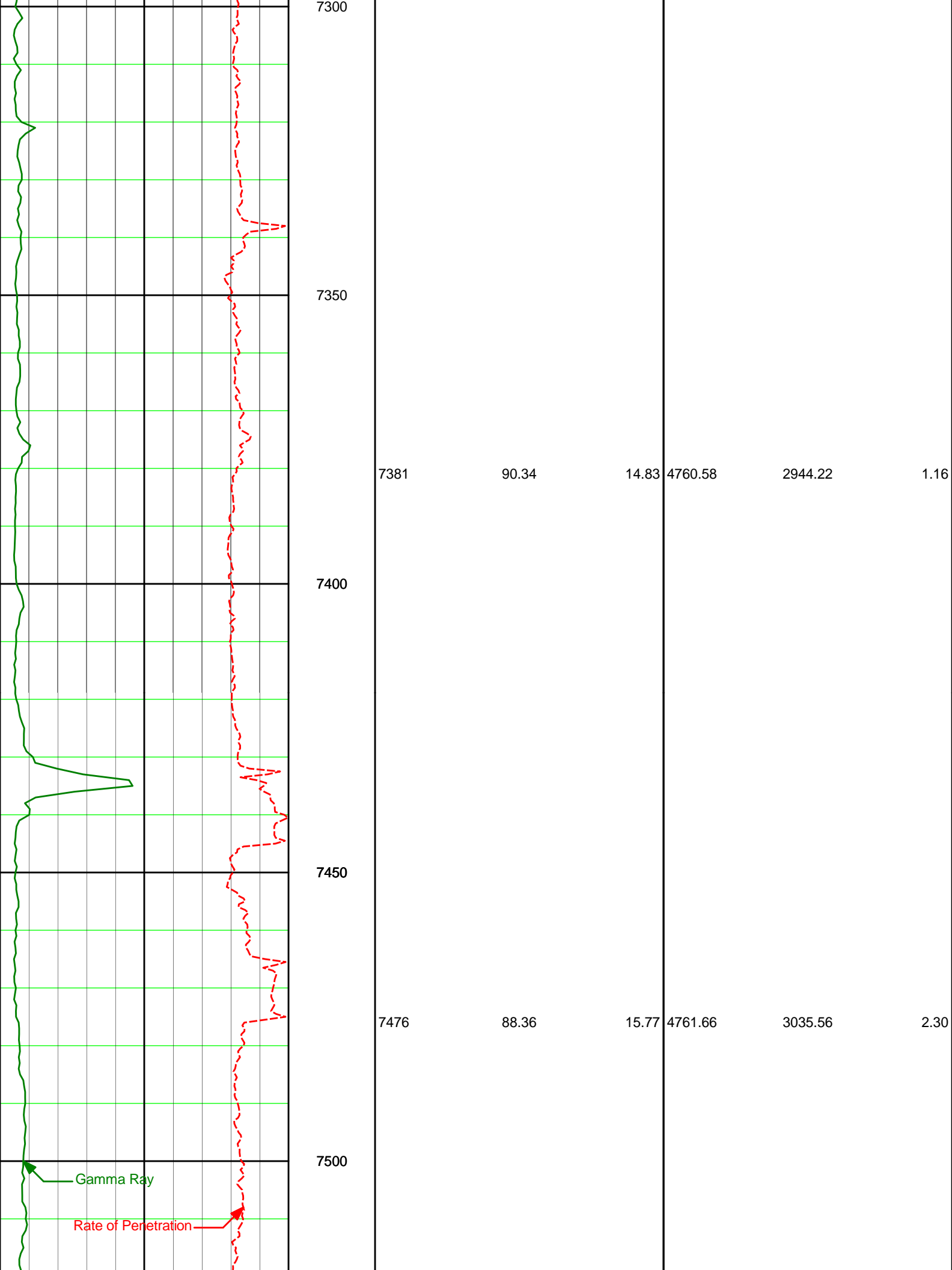
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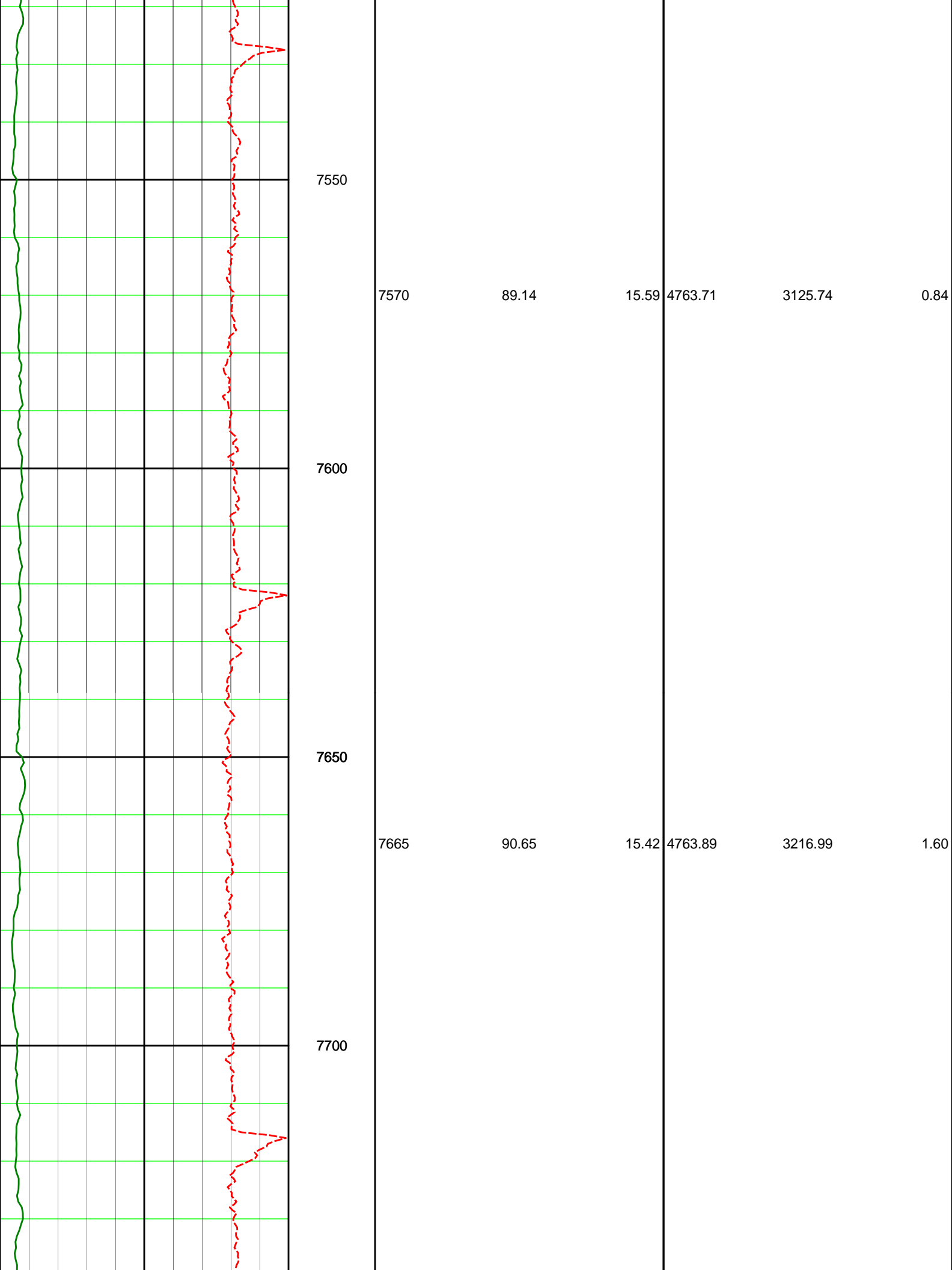
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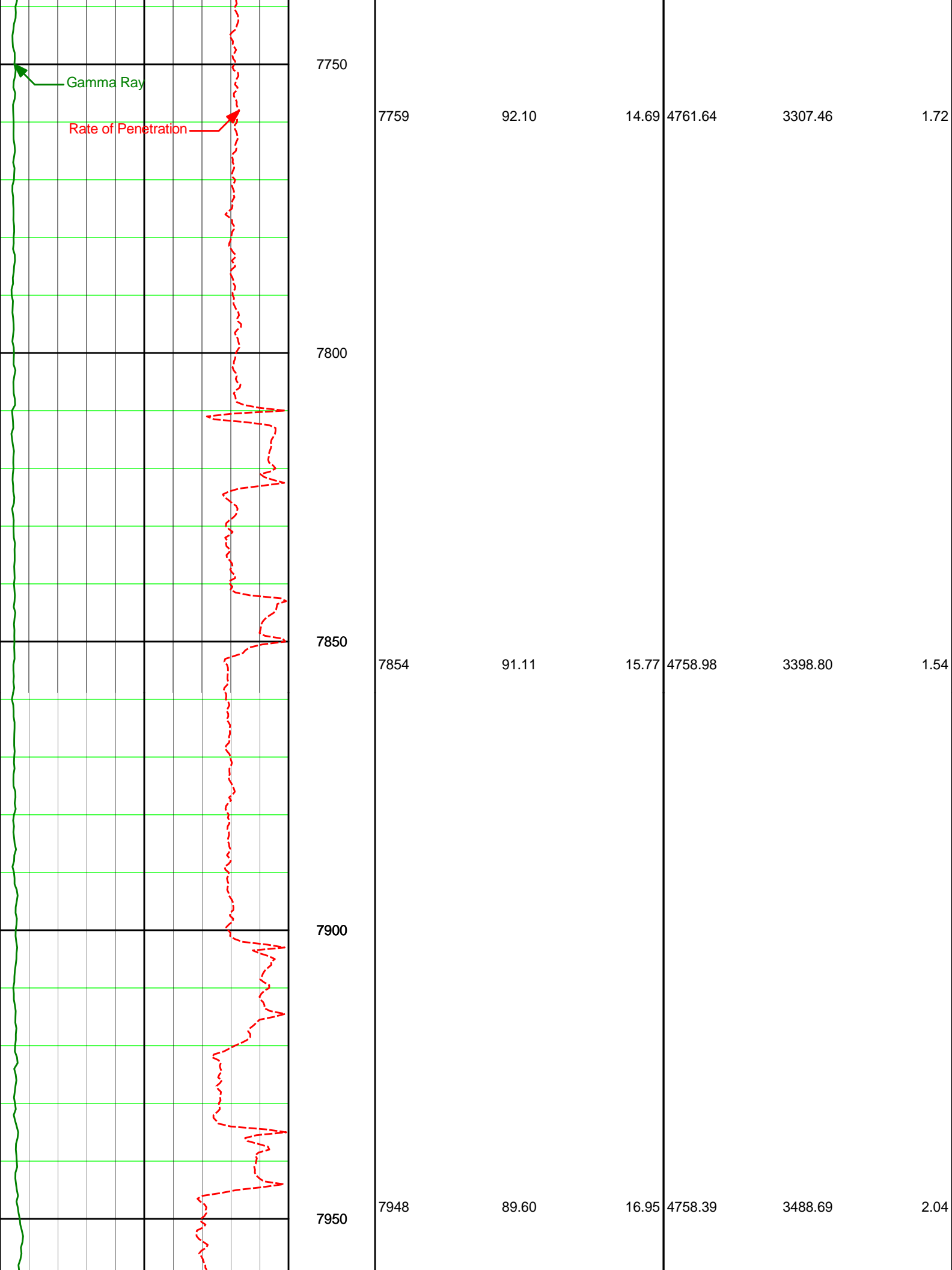
0.80

Gamma Ray

Rate of Penetration







Gamma Ray

Rate of Penetration

7750

7759

92.10

14.69

4761.64

3307.46

1.72

7800

7850

7854

91.11

15.77

4758.98

3398.80

1.54

7900

7950

7948

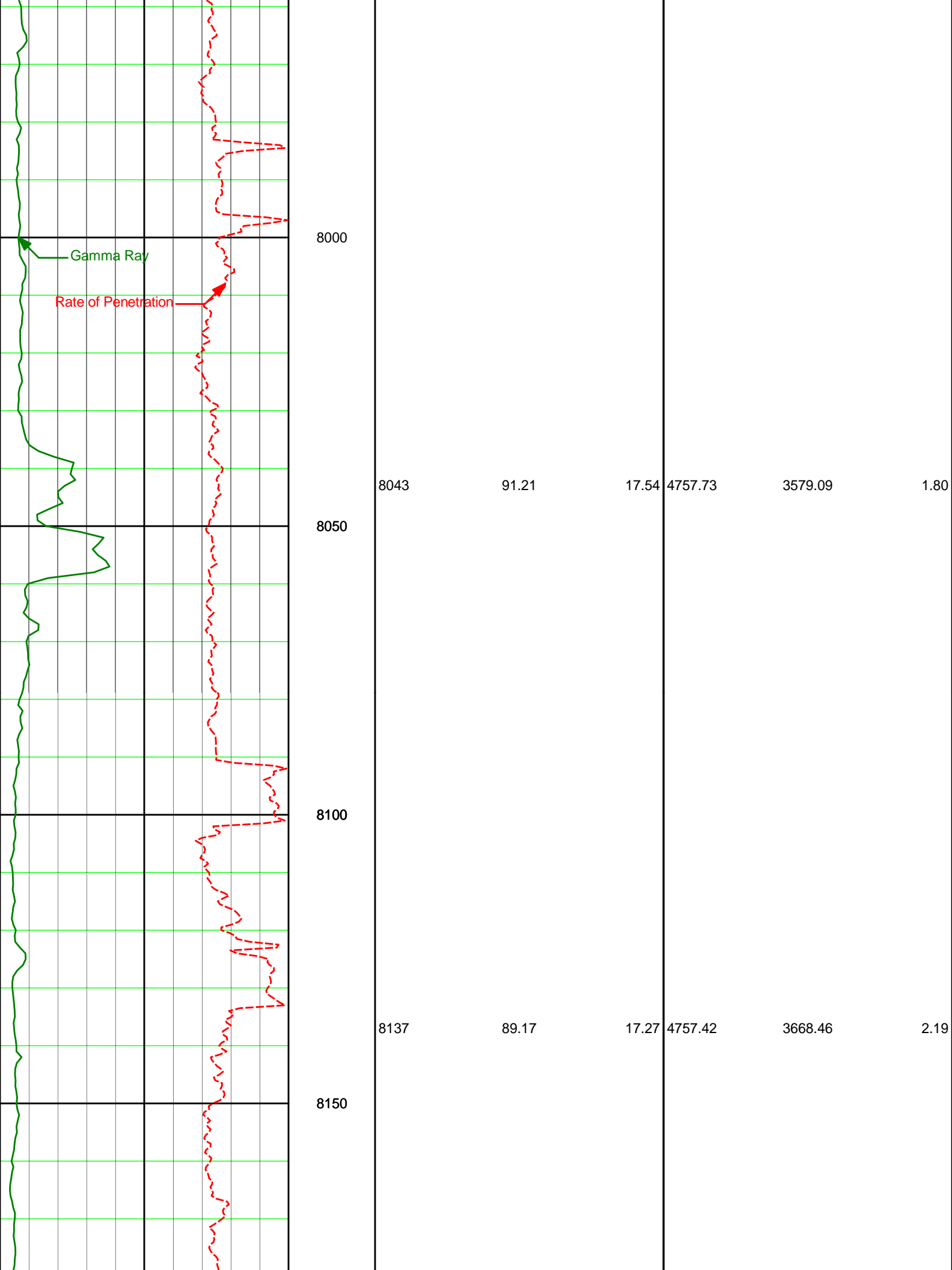
89.60

16.95

4758.39

3488.69

2.04



Gamma Ray

Rate of Penetration

8000

8043

91.21

17.54

4757.73

3579.09

1.80

8050

8100

8137

89.17

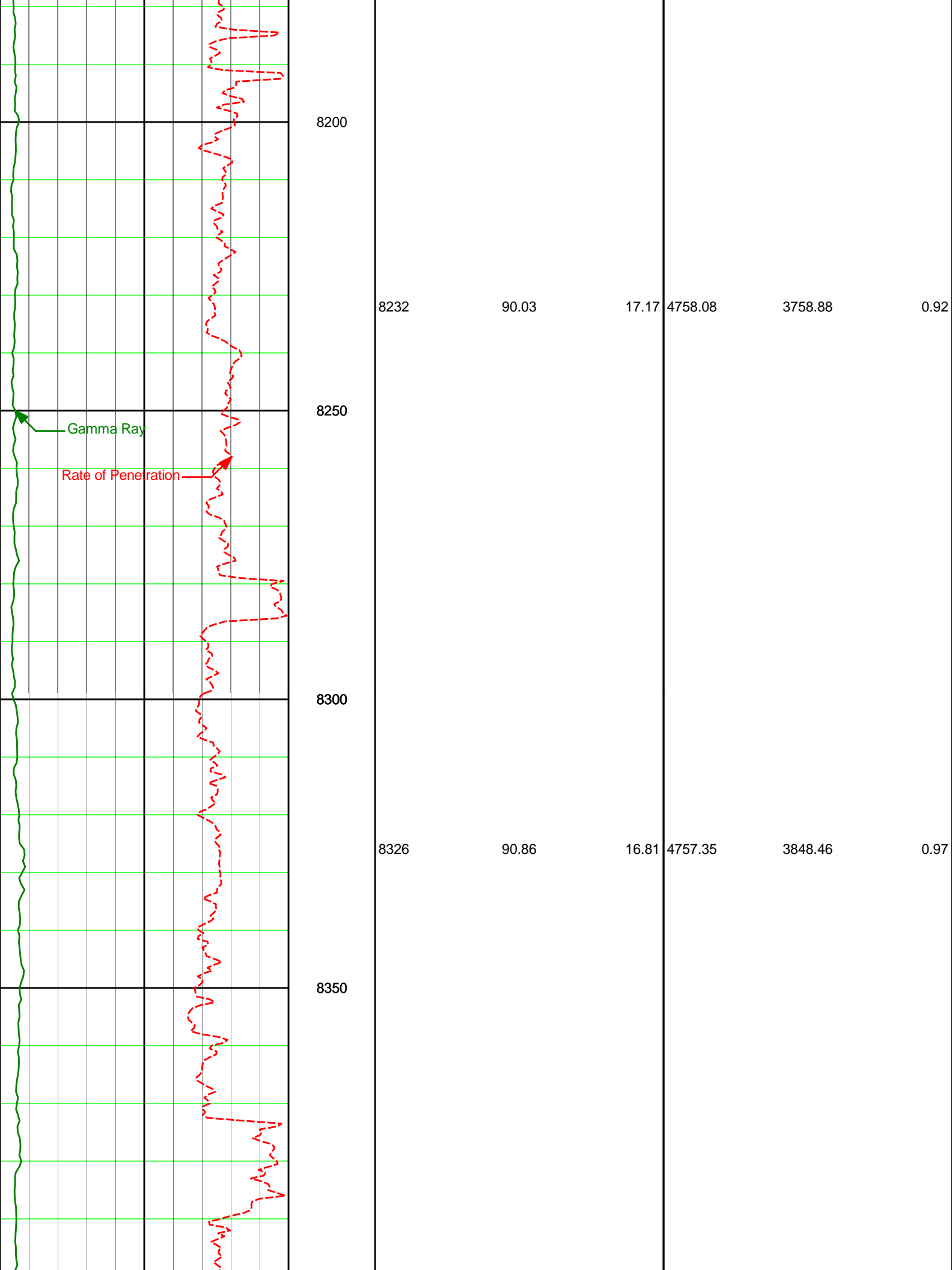
17.27

4757.42

3668.46

2.19

8150



8200

8232

90.03

17.17

4758.08

3758.88

0.92

8250

Gamma Ray

Rate of Penetration

8300

8326

90.86

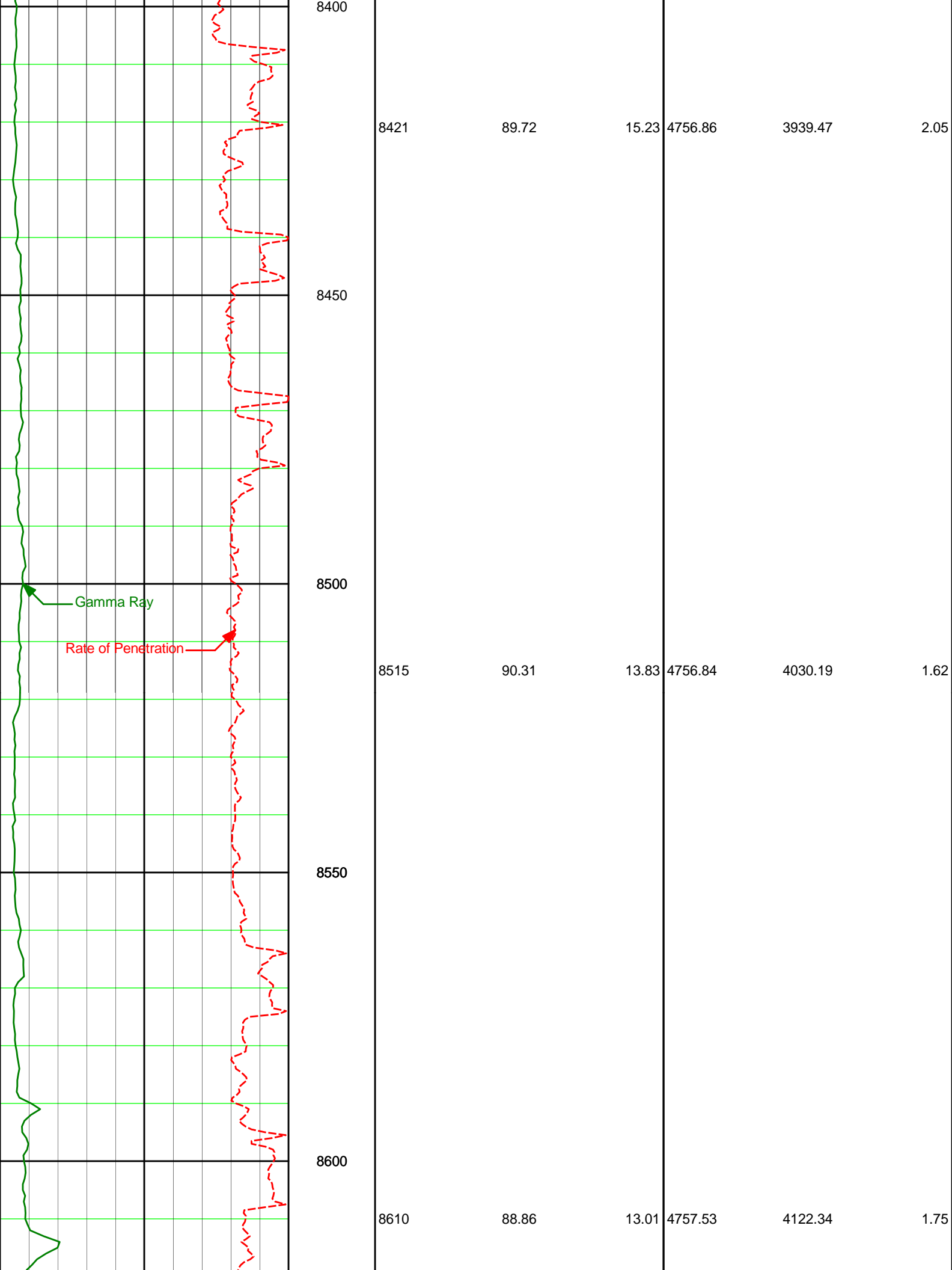
16.81

4757.35

3848.46

0.97

8350



8400

8421

89.72

15.23

4756.86

3939.47

2.05

8450

8500

Gamma Ray

Rate of Penetration

8515

90.31

13.83

4756.84

4030.19

1.62

8550

8600

8610

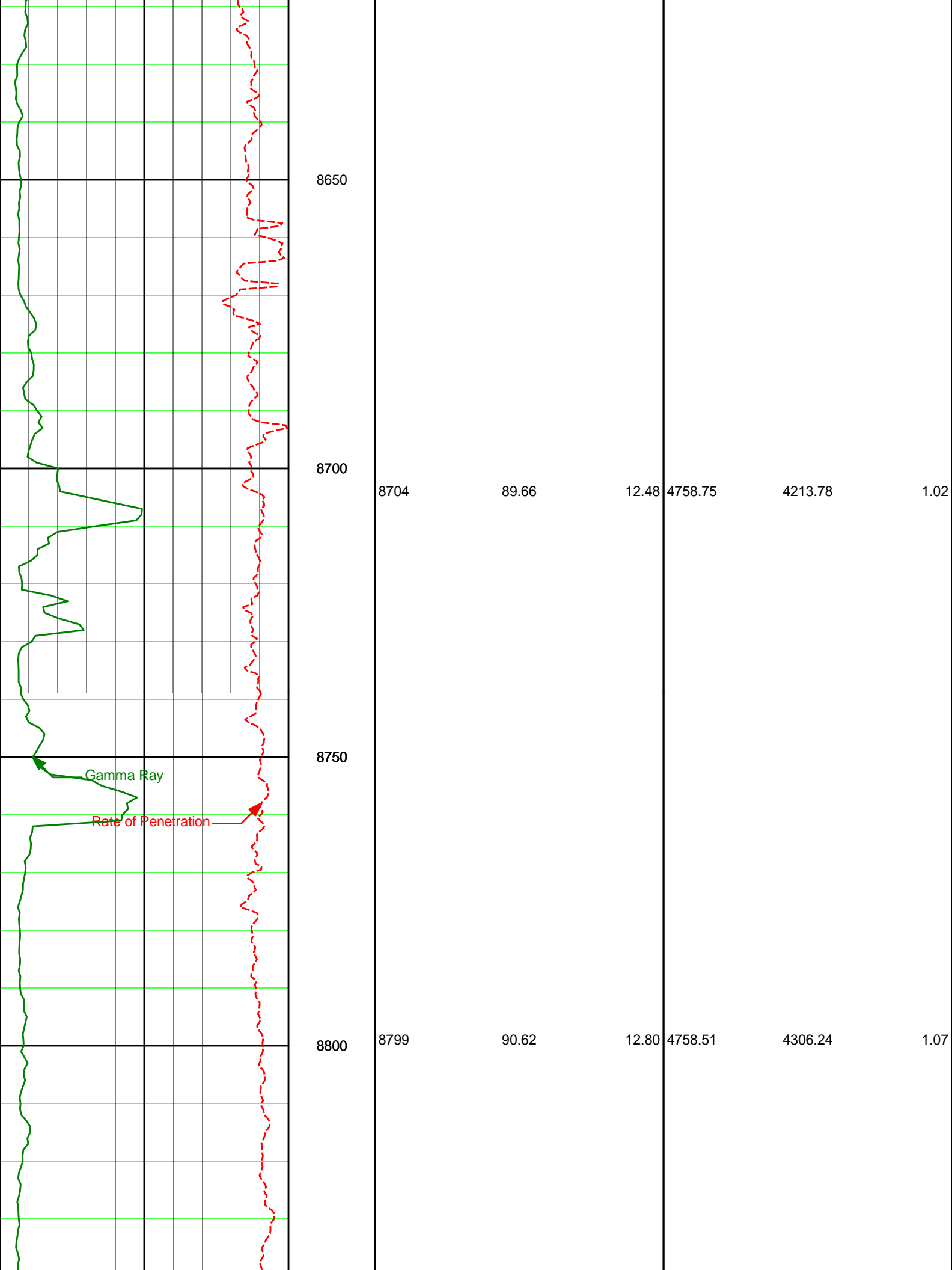
88.86

13.01

4757.53

4122.34

1.75



8650

8700

8750

8800

8704

89.66

12.48

4758.75

4213.78

1.02

8799

90.62

12.80

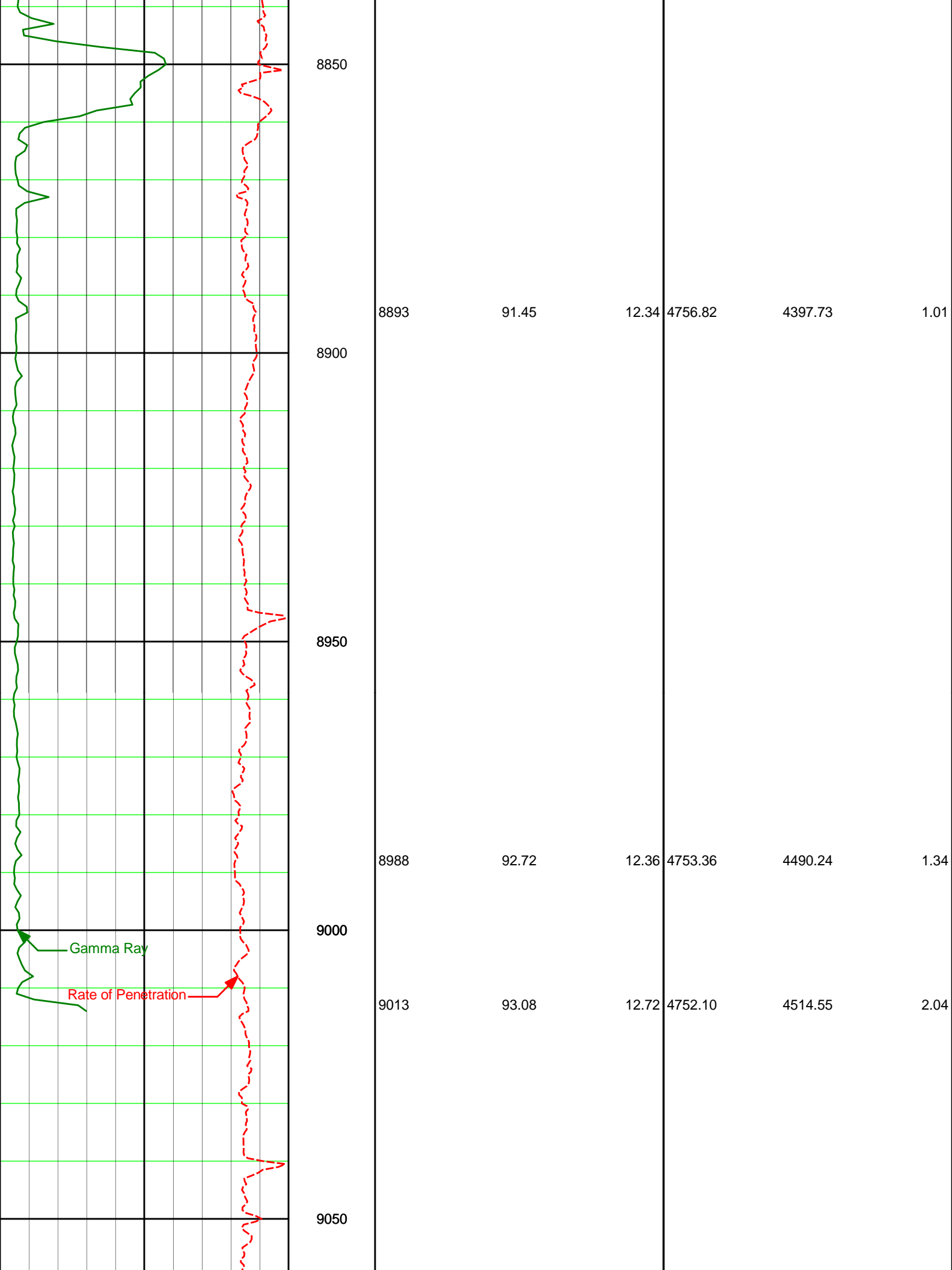
4758.51

4306.24

1.07

Gamma Ray

Rate of Penetration



8850

8893

91.45

12.34

4756.82

4397.73

1.01

8900

8950

8988

92.72

12.36

4753.36

4490.24

1.34

9000

9013

93.08

12.72

4752.10

4514.55

2.04

9050

Gamma Ray

Rate of Penetration

2021.00	0.33	21.02	2019.14	53.79 N	5.33 E	53.79	0.17
2116.00	0.56	19.19	2114.13	54.48 N	5.60 E	54.42	0.24
2210.00	0.67	14.27	2208.13	55.45 N	5.89 E	55.38	0.14
2305.00	0.28	326.23	2303.13	56.19 N	5.90 E	56.12	0.56
2399.00	0.34	304.02	2397.12	56.53 N	5.54 E	56.47	0.14
2494.00	0.37	348.26	2492.12	56.99 N	5.24 E	56.93	0.28
2588.00	0.33	112.38	2586.12	57.19 N	5.44 E	57.12	0.66
2683.00	0.64	84.39	2681.12	57.13 N	6.22 E	57.06	0.40
2778.00	0.39	132.05	2776.11	56.97 N	6.98 E	56.89	0.50
2872.00	0.07	330.40	2870.11	56.80 N	7.19 E	56.72	0.49
2967.00	0.25	241.42	2965.11	56.75 N	6.98 E	56.67	0.28
3061.00	0.31	213.97	3059.11	56.44 N	6.65 E	56.36	0.15
3156.00	0.69	212.75	3154.11	55.75 N	6.20 E	55.67	0.39
3250.00	0.30	157.23	3248.11	55.04 N	6.00 E	54.97	0.61
3345.00	0.04	326.82	3343.10	54.84 N	6.07 E	54.77	0.37
3439.00	0.31	82.13	3437.10	54.91 N	6.30 E	54.83	0.35
3534.00	0.25	47.68	3532.10	55.08 N	6.71 E	55.00	0.18
3628.00	0.35	62.49	3626.10	55.35 N	7.12 E	55.27	0.14
3723.00	0.27	33.47	3721.10	55.67 N	7.50 E	55.58	0.18
3817.00	0.61	301.43	3815.10	56.11 N	7.19 E	56.03	0.71
3912.00	0.13	305.20	3910.10	56.43 N	6.68 E	56.36	0.51
4010.00	3.32	11.65	4008.04	59.28 N	7.16 E	59.20	3.34
4041.00	5.99	14.09	4038.94	61.73 N	7.74 E	61.64	8.62
4073.00	8.54	14.01	4070.68	65.65 N	8.72 E	65.55	7.96
4105.00	10.98	14.25	4102.21	70.91 N	10.04 E	70.79	7.63
4136.00	13.62	13.92	4132.50	77.31 N	11.65 E	77.18	8.52
4168.00	16.54	14.16	4163.39	85.39 N	13.67 E	85.23	9.15
4199.00	19.47	14.18	4192.87	94.68 N	16.01 E	94.49	9.42
4231.00	22.26	13.96	4222.77	105.73 N	18.78 E	105.52	8.73
4262.00	25.09	14.27	4251.16	117.80 N	21.82 E	117.55	9.15
4293.00	27.13	14.42	4278.99	131.02 N	25.20 E	130.73	6.59
4325.00	29.13	14.54	4307.21	145.63 N	28.97 E	145.30	6.24
4356.00	31.60	14.32	4333.96	160.80 N	32.88 E	160.43	7.96
4388.00	34.20	14.68	4360.82	177.63 N	37.23 E	177.20	8.16
4419.00	36.36	15.52	4386.13	194.91 N	41.90 E	194.43	7.15
4451.00	37.94	16.32	4411.63	213.50 N	47.20 E	212.96	5.14
4482.00	39.90	16.71	4435.75	232.17 N	52.74 E	231.56	6.38
4514.00	42.40	16.06	4459.84	252.37 N	58.67 E	251.70	7.94
4545.00	45.23	14.51	4482.21	273.07 N	64.32 E	272.33	9.74
4577.00	47.27	13.96	4504.34	295.47 N	70.00 E	294.67	6.50
4608.00	50.61	13.72	4524.70	318.17 N	75.59 E	317.30	10.79
4640.00	53.31	13.58	4544.42	342.65 N	81.54 E	341.72	8.45
4672.00	55.22	13.66	4563.11	367.90 N	87.66 E	366.89	5.98
4703.00	57.02	14.04	4580.39	392.88 N	93.82 E	391.81	5.89
4735.00	59.18	13.79	4597.30	419.25 N	100.35 E	418.10	6.79
4766.00	60.08	13.94	4612.97	445.22 N	106.76 E	444.00	2.95
4798.00	60.36	14.16	4628.87	472.16 N	113.50 E	470.86	1.05
4829.00	60.76	14.27	4644.10	498.33 N	120.13 E	496.96	1.34
4861.00	61.26	14.36	4659.61	525.45 N	127.05 E	524.00	1.59
4892.00	62.19	14.57	4674.29	551.89 N	133.86 E	550.36	3.03
4924.00	65.18	14.38	4688.48	579.66 N	141.03 E	578.05	9.39
4955.00	67.85	14.37	4700.83	607.20 N	148.09 E	605.51	8.59
4987.00	69.57	13.90	4712.45	636.11 N	155.37 E	634.33	5.55
5018.00	71.20	13.99	4722.86	664.45 N	162.41 E	662.59	5.28
5050.00	73.27	13.90	4732.62	694.02 N	169.75 E	692.08	6.48
5081.00	76.69	13.92	4740.66	723.08 N	176.95 E	721.06	11.04
5113.00	79.92	14.29	4747.14	753.47 N	184.59 E	751.36	10.14
5144.00	81.90	14.65	4752.04	783.11 N	192.23 E	780.91	6.49
5176.00	82.53	14.69	4756.37	813.78 N	200.26 E	811.49	1.98
5207.00	84.31	14.52	4759.93	843.58 N	208.02 E	841.20	5.78
5239.00	86.76	13.72	4762.42	874.51 N	215.81 E	872.05	8.05
5270.00	88.70	13.75	4763.64	904.60 N	223.16 E	902.05	6.26
5302.00	89.29	13.88	4764.20	935.67 N	230.80 E	933.04	1.88
5333.00	89.69	14.30	4764.47	965.74 N	238.35 E	963.02	1.88
5370.00	90.06	14.34	4764.55	1001.59 N	247.50 E	998.76	1.00
5466.00	90.62	14.51	4763.99	1094.56 N	271.41 E	1091.46	0.61
5497.00	90.96	13.77	4763.56	1124.62 N	278.99 E	1121.43	2.62
5528.00	90.77	13.55	4763.09	1154.74 N	286.31 E	1151.47	0.93
5558.00	90.25	13.45	4762.83	1183.91 N	293.31 E	1180.56	1.78
5589.00	89.35	13.74	4762.94	1214.04 N	300.59 E	1210.61	3.03
5620.00	89.54	13.59	4763.24	1244.16 N	307.92 E	1240.64	0.76
5651.00	89.75	13.54	4763.43	1274.29 N	315.19 E	1270.69	0.72
5681.00	90.22	13.41	4763.44	1303.47 N	322.18 E	1299.79	1.60
5774.00	88.12	12.79	4764.79	1394.03 N	343.26 E	1390.11	2.35
5869.00	88.89	12.45	4767.27	1486.71 N	364.01 E	1482.55	0.89

5963.00	90.00	11.71	4768.18	1578.62 N	383.67 E	1574.23	1.42
6057.00	90.83	11.28	4767.49	1670.73 N	402.40 E	1666.13	1.00
6152.00	90.65	11.99	4766.27	1763.77 N	421.56 E	1758.95	0.77
6246.00	90.89	12.49	4765.00	1855.62 N	441.49 E	1850.58	0.59
6341.00	91.26	13.31	4763.21	1948.21 N	462.69 E	1942.92	0.95
6435.00	90.56	14.96	4761.72	2039.35 N	485.65 E	2033.79	1.91
6530.00	90.09	14.90	4761.18	2131.14 N	510.12 E	2125.31	0.49
6625.00	91.39	14.14	4759.95	2223.09 N	533.94 E	2216.99	1.58
6719.00	90.06	15.00	4758.77	2314.06 N	557.59 E	2307.69	1.68
6814.00	89.78	15.03	4758.89	2405.82 N	582.20 E	2399.16	0.29
6908.00	90.86	14.73	4758.36	2496.66 N	606.33 E	2489.73	1.19
7003.00	89.54	15.60	4758.03	2588.35 N	631.19 E	2581.14	1.67
7097.00	90.31	15.52	4758.16	2678.90 N	656.40 E	2671.40	0.83
7192.00	88.80	15.85	4758.90	2770.36 N	682.08 E	2762.57	1.63
7287.00	89.41	15.40	4760.38	2861.84 N	707.66 E	2853.75	0.80
7381.00	90.34	14.83	4760.58	2952.58 N	732.18 E	2944.22	1.16
7476.00	88.36	15.77	4761.66	3044.20 N	757.24 E	3035.56	2.30
7570.00	89.14	15.59	4763.71	3134.68 N	782.65 E	3125.74	0.84
7665.00	90.65	15.42	4763.89	3226.22 N	808.04 E	3216.99	1.60
7759.00	92.10	14.69	4761.64	3316.97 N	832.45 E	3307.46	1.72
7854.00	91.11	15.77	4758.98	3408.59 N	857.40 E	3398.80	1.54
7948.00	89.60	16.95	4758.39	3498.78 N	883.88 E	3488.69	2.04
8043.00	91.21	17.54	4757.73	3589.50 N	912.04 E	3579.09	1.80
8137.00	89.17	17.27	4757.42	3679.19 N	940.16 E	3668.46	2.19
8232.00	90.03	17.17	4758.08	3769.93 N	968.28 E	3758.88	0.92
8326.00	90.86	16.81	4757.35	3859.83 N	995.74 E	3848.46	0.97
8421.00	89.72	15.23	4756.86	3951.13 N	1021.95 E	3939.47	2.05
8515.00	90.31	13.83	4756.84	4042.12 N	1045.53 E	4030.19	1.62
8610.00	88.86	13.01	4757.53	4134.53 N	1067.58 E	4122.34	1.75
8704.00	89.66	12.48	4758.75	4226.20 N	1088.31 E	4213.78	1.02
8799.00	90.62	12.80	4758.51	4318.90 N	1109.10 E	4306.24	1.07
8893.00	91.45	12.34	4756.82	4410.63 N	1129.55 E	4397.73	1.01
8988.00	92.72	12.36	4753.36	4503.37 N	1149.86 E	4490.24	1.34
9013.00	93.08	12.72	4752.10	4527.74 N	1155.28 E	4514.55	2.04
9063.00	93.08	12.72	4749.41	4576.44 N	1166.27 E	4563.13	0.01

CALCULATION BASED ON MINIMUM CURVATURE METHOD

**SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT**

**VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 359.36 DEGREES (TRUE)
A TOTAL CORRECTION OF 4.75 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 9063.00 FEET
IS 4722.71 FEET ALONG 14.30 DEGREES (TRUE)**